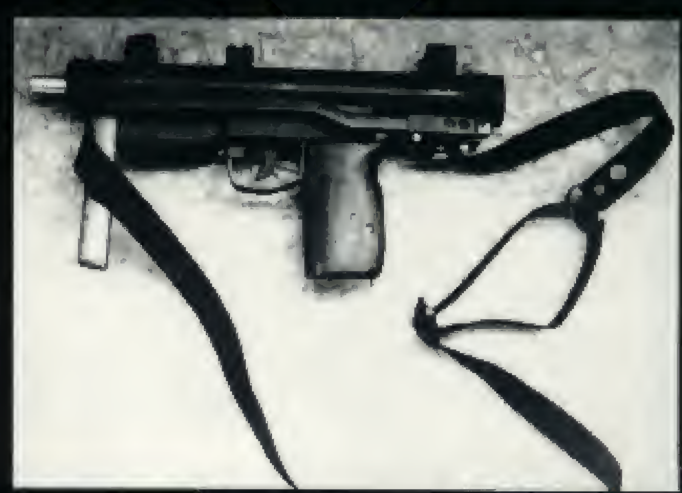
A DO-IT-YOURSELF

SUBMACHINE GUN



Gérard Métral

It's Homemade, 9mm, Lightweight, Durable—and It'll Never Be on Any Import Ban Lists!

CONTENTS

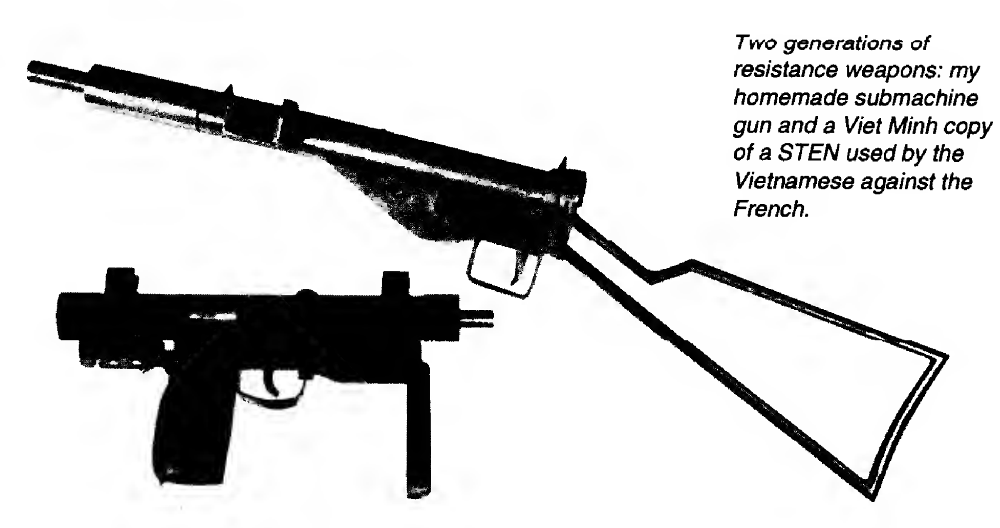
PREFACE

The uprising of the Warsaw ghetto in April 1943 came as a complete surprise to the Nazis. A small number of young Jews armed mostly with pistols and a few rifles, hand grenades, and fire bombs offered a strong and desperate resistance to crack SS troops. Many German soldiers were killed or wounded, and only after days of hard fighting and the use of heavy weapons did the Nazis take control of the ghetto. Only a few Jews escaped through the canals; the others, many hundreds, either died during the fighting or were executed in concentration camps. Militarily, it was a defeat for the Jews, but it is also a wonderful lesson in honor: it is better to die standing and fighting than to be driven without resistance like sheep to the slaughterhouse.

Years later, during a TV show commemorating the uprising, one of the few Jewish survivors remarked, "There is one thing I regret very much: I didn't have a submachine gun."

To resist tyranny or to make a contribution to the liberation of his own occupied country, a human being, as courageous as he may be, is helpless without weapons. In some favorable circumstances it is possible to rely on foreign help, but in many others, especially at the beginning of an uprising, one must only rely on one's own forces. To face a well-armed oppressor, a freedom fighter needs firepower. In such circumstances submachine guns are the best choice: they aren't as powerful as assault rifles, but they are much easier to conceal, making them ideal for clandestine operations.

Even in countries where there is little danger of invasion or foreign occupation and oppression, a new threat is escalating: that of violent crime. In many towns and countries in the most advanced parts of the world, ordinary citizens are at risk of being assaulted, raped, and often killed. In many regions the police are no longer able to protect the people. Worst of all, many countries forbid ordinary citizens from owning firearms. Criminals, who by definition don't respect laws, have no problem



Two generations of resistance weapons: my homemade submachine gun and a Viet Minh copy of a STEN used by the Vietnamese against the French.

arming themselves and can therefore act with the abandon of a fox in an unguarded henhouse.

This book was written for those who don't want to be passive victims of oppression or criminals and who have no other ways of obtaining weapons.

As can be seen in the Bibliography, other books exist about weapons designed with the same purpose, but the Métral gun presented in this book has some unique features that make it uniquely suitable for self-defense. Small and handy, it can be disassembled quickly into a limited number of easy-to-conceal parts. It was also specially designed for clandestine manufacture, even on a large scale.

The author made prototypes, tested them, and got rid of all the bugs that occurred during development. The result is an efficient and reliable weapon that you can count on.

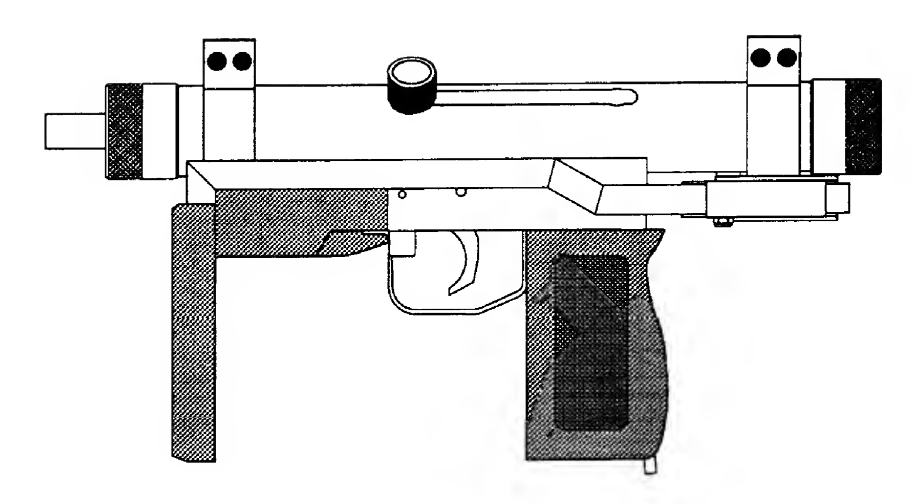


Illustration of the Métral submachine gun described in this book.



Above: The AKM Kalashnikov is powerful and reliable, and therefore well suited for guerrilla warfare. Below: The Métral submachine gun is compact and handy, and therefore ideal for clandestine operations.

PRESENTATION

SPECIFICATIONS

The Métral gun was designed according to the following specifications:

1. It must be able to be built by people or groups with limited equipment. It should be feasible for an individual to produce the entire weapon in a small workshop.
2. Decentralization of large-scale production of the various parts is possible.
3. Most parts should appear innocuous, looking like pieces of ordinary civilian machines or tools.
4. Taken down, the gun should be able to be concealed easily; for example in a car, if a couple of components are found, it should not be obvious without a complete search of the vehicle that they are submachine gun parts.
5. The size of the weapon facilitates its use from a car.
6. Users should meet, on equal terms, opponents armed with such submachine guns as the Uzi, Beretta Model 12, Heckler & Koch MP5, or similar weapons found in most parts of the world.
7. The gun has an attractive appearance.

DESCRIPTION

The Métral gun is a 9mm Parabellum (called also 9mm Luger, 9x19, or other local designations). Its design is based on known principles and solutions found in other guns, put together with the aim of reliability and ease of manufacture under clandestine conditions. The general shape of the weapon is similar to the Czech CZ 25 and the Uzi. The selector of the trigger mechanism comes from the Suomi M1931 and the bolt security from the Ingram M10. I claim as my own inventions the bolt construction and the way the weapon is assembled. The folding stock adopted is also my brainchild.

A very critical part of a submachine gun is the magazine. I decided to use the STEN magazine because originals are easy to find at low prices. It is also possible to build usable fiberglass versions of this magazine.

With small modifications in the pistol grip's dimensions, magazine latch, and perhaps the loading ramp and underside of the bolt, it is possible to use magazines designed for other weapons.

I kept the number of different parts to a minimum to ease decentralized production. For example, all symmetrical parts such as plugs, support rings, and sights are almost identical. I also tried to make them look like ordinary mechanical components to conceal their final function.

Data for Métral Gun

Cartridge: 9mmx19
Operation: blowback, selective fire
Feed: 32-round box magazine (from British World War II STEN gun)
Weight, empty: 2.9 kg
Length: (butt extended) 600 mm; (butt folded) 360 mm
Barrel: 200 mm
Rifling: 4 grooves, rh, one turn in 254 mm
Muzzle velocity: 390 m/s
Rate of fire (cyclic): 600 rounds per minute

Data for Uzi

Cartridge: 9mmx19
Operation: blowback, selective fire
Feed: 25- and 32-round box magazine
Weight, empty: 3.7 kg
Length: (metal stock extended) 640 mm; (stock folded) 455 mm
Barrel: 260 mm
Rifling: 4 grooves, rh, one turn in 254 mm
Muzzle velocity: 390 m/s
Rate of fire (cyclic): 600 rounds per minute

OPERATING INSTRUCTIONS

How to Load and Fire the Métral

1. Pull the selector to the rear safe position.
2. Pull the cocking handle to the rear. The weapon fires from an open bolt, and therefore the bolt will remain to the rear. Rotate the cocking handle 90° clockwise or counterclockwise as a safety measure.
3. Insert a loaded magazine into the magazine well, located in the pistol grip, and push in until it locks with a click. Try to pull it out to be sure it is firmly locked in. Rotate the cocking handle 90° back to its firing position.

Caution: Many people are used to inserting the magazine first and then pulling the bolt back, which is the usual way to load an automatic pistol. With a



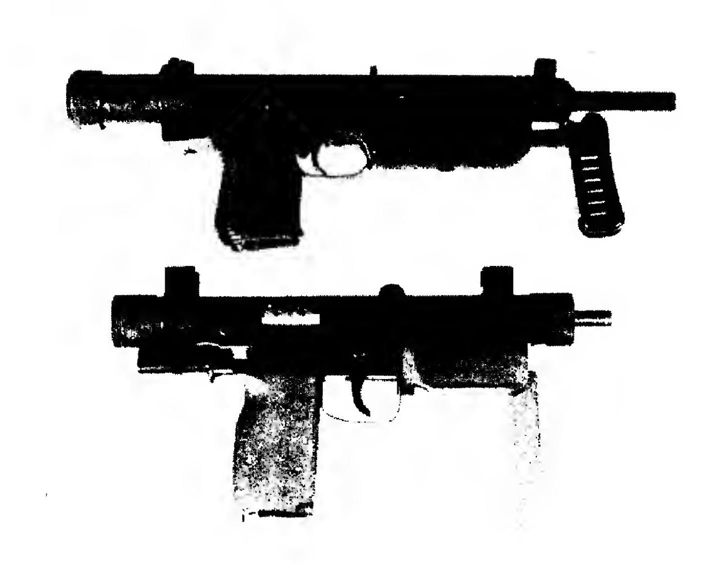
This gun is easy to hide, e.g., in the tire of the spare wheel. With adequate filling, a tubeless tire may be inflated and the loaded spare wheel used for a short distance.



The small size of the Métral gun makes it ideal to carry in a car in an unsafe country. (In a small car use a short 15-round magazine, which is sufficient for a first reaction and easier to handle in a cramped space).



Author's daughter with Métral submachine gun in car.



A comparison of the CZ 25 (top) and the Métral gun (bottom).



Comparison of Uzi (top) and Métral (bottom).

submachine gun, if you fire from an open bolt position, there is a danger of releasing the bolt accidentally before it is caught by the sear; the bolt will then ram the first cartridge into the chamber and fire! The order of operation given above is much safer.

To fire single shots, push the selector to the middle position. When you squeeze the trigger, the gun will fire one shot, eject the empty case, and then the bolt will remain to the rear. To fire another shot, you must release the trigger and pull it again.

To fire full auto, push the selector completely forward. The gun will fire automatically until the ammunition is exhausted or until the trigger is released.

The position of the selector is easy to feel at night because of its relation to the trigger guard.

To remove the magazine, push the magazine latch at the bottom rear of the pistol grip, and pull the magazine out of the weapon.

To unload the gun: remove the magazine. Then squeeze the trigger while retaining the bolt handle. Let the bolt go slowly forward and ensure by looking through the ejection port that the chamber is empty.

Safety Measures

1. Store the gun unloaded, without a magazine, bolt forward locked by the bolt handle rotated 90°, and with the selector set at "safe."

   In situations where there in no immediate danger keep the gun with magazine inserted, bolt rearward and locked by the bolt handle, and selector set at "safe."
2. In a hostile environment carry the gun loaded, bolt rearward with handle unlocked and selector set at "safe." To fire, just push the selector forward with the back of your forefinger and squeeze the trigger.
3. If the gun is ready to fire, with bolt open and magazine inserted, and you have to move quickly to another position, lock the bolt by rotating the bolt handle. This will prevent an accidental firing while you are crawling, jumping, or making any other movement. Unlock the bolt once you are ready to fire again.
4. Never carry the gun with a loaded magazine inserted and bolt forward unlocked by the bolt handle: it may fire accidentally if dropped.

If you're going to store the gun, ensure that the chamber is empty and then pull the bolt rearward until you can see the chamber through the ejection slot. In case of ejection failure or

misfire, you will see a cartridge held to the bolt face by the extractor. In that case, pull the bolt rearward until it falls either through the ejection port or the pistol grip.

Stripping

1. Remove the magazine.
2. Unfold the stock.
3. Push the selector to the "single shot" position. Holding the bolt handle with your left hand, let the bolt go slowly forward by pressing the trigger.
4. With the tip of a bullet, push down the stud on the side of the front plug, unscrew the plug, and remove it.
5. Separate the trigger mechanism housing from the upper part of the gun.
6. Pull the operating handle out and remove the barrel and bolt together from the front end of the gun.
7. Take the barrel out of the bolt extension.
8. Reassemble the gun in the reverse order.
9. Take care to insert the ejector in its hole on the rear face of the bolt; use a finger inserted through the ejection port to guide it while you push the bolt assembly and barrel rearward with the other hand.
10. Push the barrel to align the bolt handle location of the bolt with the opening in the receiver and insert the bolt handle.

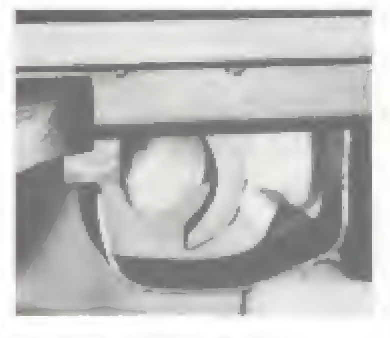
Folding Stock

To fold the stock, pull it to the rear and to the left. Fold it forward until it comes along the trigger mechanism housing. Push the handle forward and to the right until the stud is engaged in its slot. Then release the handle: spring pressure pushes the stock back to lock it.

To unfold the stock, push it forward and then to the left. Once unfolded let it go forward under spring pressure and lock. If necessary, push it forward to help the locking operation



Inserting the magazine. Note the cocking handle locked in the rear position.



Push the selector with your forefinger.



Rotating the bolt handle.



Use the tip of a bullet to release the front plug.



Field-stripped Métral.



Unfolding the stock.

HOW THE GUN WORKS

With the bolt in rearward position, pull the trigger. This depresses the sear, releasing the bolt. The main spring drives the bolt forward. The lower edge of the bolt face strips a round from the magazine and forces it forward into the chamber.

Firing occurs when the fixed firing pin strikes the primer of the chambered round. Simultaneously, the extractor engages in the extraction groove of the cartridge case. The cartridge case is forced back by gas pressure and drives the bolt rearward.

The cartridge case, held onto the bolt face by the extractor, clears the chamber, strikes the tip of the stationary ejector rod, and pivots to the right. At the same time, the ejection ports of the bolt carrier and the receiver move into alignment, allowing the spent case to be thrown clear of the weapon.

The spring and the rear cap of the body bring the bolt to rest. If the selector is set to "single shot" the sear will have risen to hold the bolt to the rear until the trigger is operated again. If the selector is set to "auto," the bolt will move forward again, driven by the spring, and the cycle will be repeated.

The bolt carrier's weight and length of travel help to reduce the cyclic rate of fire.

Warning: This weapon was designed to fire 9x19mm NATO standard ammunition (115-grains = 7.45 g bullet, with a muzzle velocity of 1,320 fps = 396 m/s). There are many other loads for the 9mm Luger ammunition, some weaker than the NATO standard. If you want to use these weaker loads, be warned: there is a risk that the bolt will have sufficient energy to travel backward far

enough to pick a fresh cartridge, but not enough to be caught by the sear; the gun will then fire the entire magazine automatically.

To prevent such accidents from happening, test the gun with the ammunition you are going to use. Load only one shot in the magazine, put the selector at single shot, and fire. If the gun does eject correctly and the bolt is caught by the sear, you may use this kind of ammunition without any transformation of the gun. If the bolt isn't held back, your bolt is too heavy or your spring too strong. You can then choose another brand of ammunition, purchase a weaker spring, or lighten the bolt by drilling holes in the left side of the bolt carrier.

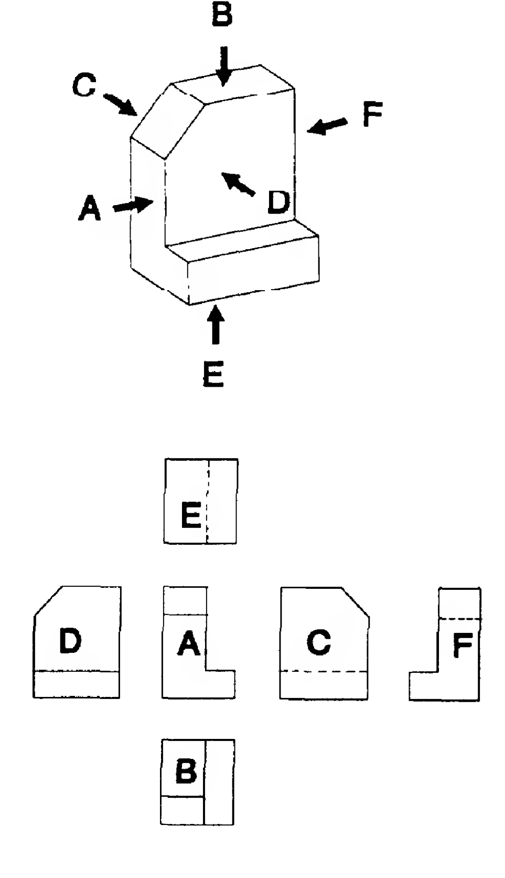
UNITS AND STANDARDS

All drawings are made according to the International Standards Organization (ISO) standards, and dimensions are expressed in the metric system. The following reasons dictated these choices:

1. Most parts of the world use these systems. Even in the United States there is a scheduled gradual transition to the metric system.
2. For any mechanical system a prototype must be built and tested, and remedies must be found for the inevitable teething troubles. My submachine gun was built in Europe, using locally available supplies; it was therefore necessary to use the metric system.

A conversion will be necessary to build the gun in the United States or in countries using British standards. Values for this conversion are given in Appendix C.

People who are used to working with drawings made according the ANSI system should be warned: the ISO system doesn't present the views in the same order. The ISO representation system is shown here.



HOW TO BUILD THE GUN

SKILLS REQUIRED

This book isn't a manual for beginners in mechanics. I presume that the reader already has basic knowledge and skills. Therefore the following instructions are restricted to the minimum. I will only present the general order of operations I used to build the prototype and give some tips to help avoid common pitfalls.

EQUIPMENT

To build the Métral you need access to the following equipment:

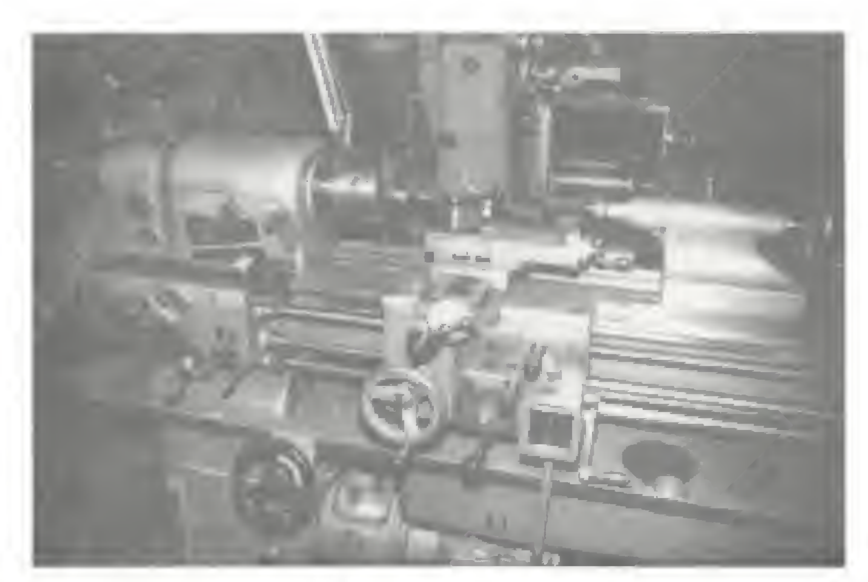
- a lathe big enough to turn the longer parts (350 mm = 14 inches)
- a drill press
- a good heavy vise
- a vertical milling machine (helpful, but not absolutely necessary)
- tools to thread the body and plugs (it may be done on the lathe or with equipment for threading gas pipes)
- welding sets (electrical or acetylene)
- a grinding wheel
- files, drill, taps, hacksaw, and other basic hand tools

You may not have all the needed machine tools, but a lathe and a drill press are fairly common in automotive shops. One way to get these parts built may be to contact a local vocational or trade school that has courses in mechanics; teachers and students often need new models for practice.

MATERIALS

Steel tube, sheet, and bar stock are easy to obtain in industrial countries. You may use ordinary steel for most parts of the gun; a few pieces need to be hardened. Automobile and truck scrap yards are good sources for high-quality steel; look for axles and suspension components.

Purchase the main spring, barrel, and magazine from industrial manufacturers, because the are difficult to build. Try doing it yourself only if you have no other choice.



A lathe is indispensable to the construction of this gun.



A milling machine is recommended but not essential.



You must have access to a drill press to complete this gun.

List of Materials Used to Build the Prototype

- Seamless steel tube, diameter 38/34 mm
- Steel bar diameter 40 mm
- Steel tube diameter 34/18 mm
- Heat-treatable steel bar diameter 34 mm
- Heat-treatable steel bar diameter 18 mm
- Steel bar diameter 20 mm
- Very tough steel diameter 6 mm (for example, 980-1,180N/mm2 DIN 34 CrNiMo 6)
- Commercial special steel barrel rifled for 9mm Luger
- Heat-treatable steel bars diameter 8, 6, 5, 4, 3, and 2 mm
- U or square 30 mm x 30 mm steel profile, 2 mm thick
- 10 mm x 15 mm heat-treatable steel bar
- Steel tube diameter 6/4 mm
- 8 mm x 20 mm heat-treatable steel bar
- 8 mm x 6 mm heat-treatable steel bar
- 6 mm x 16 mm aluminum bar (for the front sight support)
- 5 mm x 12 mm steel bar
- 5 mm x 30 mm steel bar
- 3 mm x 15 mm heat-treatable steel bar
- 20 mm x 20 mm steel tube, 2 mm thick
- 15 mm x 15 mm steel tube, 1.5 mm thick
- 12 mm x 12 mm steel tube, 1.5 mm thick
- 2 mm steel sheet
- 1.5 mm steel sheet
- 2 mm x 10 mm heat-treatable steel bar
- Industrial coil springs (see drawings)
- 0.5 mm diameter piano wire
- Standard commercial screws and nuts M5, M4, and M3
- Surplus STEN gun magazines

BUILDING INSTRUCTIONS

Warning: Before beginning to work on any piece, read the description and study all the drawings completely and carefully. Be sure to have all tools at hand. You may sometimes find that the order of operations given here does not fit your particular working conditions; in such cases you may, of course, adapt it, but be careful. I highly recommend that you go over the entire engineering process mentally before you act with your hands.

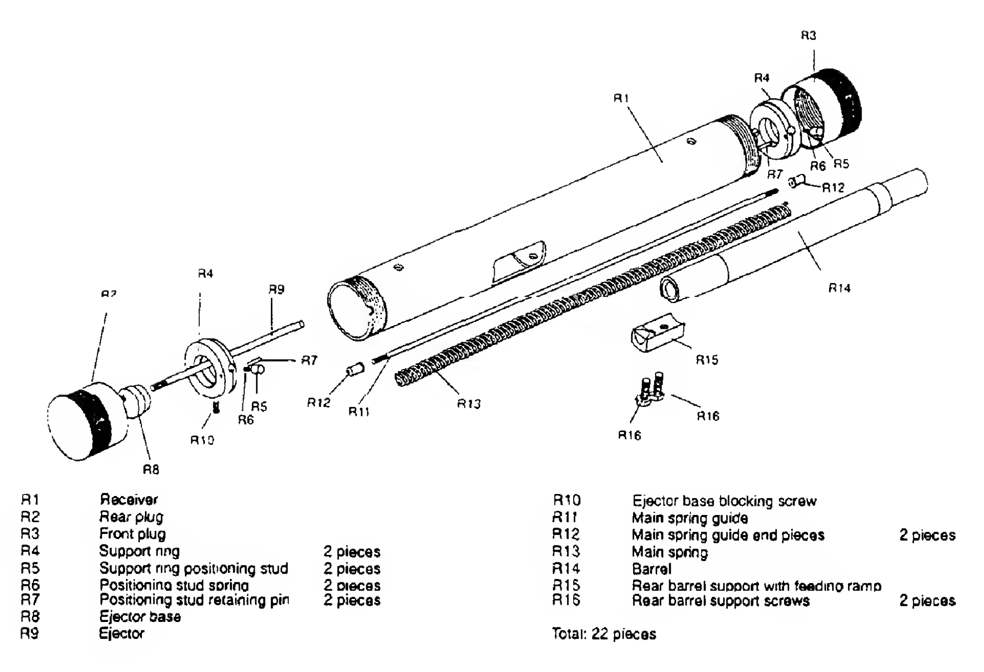
Group 1: Receiver with Barrel and Main Spring

Receiver (Drawings 001 and 002)

Use seamless steel tube. The prototype was made from 38/34 mm diameter tubing. Cut the tube the desired length. Cut the openings with a milling machine or with a drill press and files.

The only tricky part is the threading for the plugs. You can either use a threading tool or do it on the lathe. Thread to metric M38 x 1.5, as shown in the drawing.

If you are building a single gun, thread it on the lathe. If you want to make several, purchase appropriate threading tools.



R1	Receiver		R10	Ejector base blocking screw	
R2	Rear plug		R11	Main spring guide	
R3	Front plug		R12	Main spring guide end pieces	2 pieces
R4	Support ring	2 pieces	R13	Main spring	
R5	Support ring positioning stud	2 pieces	R14	Barrel	
R6	Positioning stud spring	2 pieces	R15	Rear barrel support with feeding ramp	
R7	Positioning stud retaining pin	2 pieces	R16	Rear barrel support screws	2 pieces
R8	Ejector base				
R9	Ejector			Total: 22 pieces	

Receiver with barrel and main spring.

Plugs (Drawing 003)

The only difference between the front and the back plug is the opening for the barrel in the former. Both are machined out of solid 40 mm diameter round stock. All of the work is done on the lathe.

First cut the stock to the desired length, and bore out the inside to a 36.5 mm diameter (or the diameter needed for the threading you have chosen).

Next, thread the inside with an appropriate tool.

Next, carve knurls over a 15 mm space on the outside surface.

Then turn the inside to a diameter of 38 mm for 10 mm. Use a soft metal sheet between the mandrel's jaws and the piece to protect the knurled part.

The hole for the positioning stud is drilled during the final adjustment.

Front and Rear Support Rings (Drawings 004 and 005)

These two pieces are identical and therefore interchangeable. You must drill the hole for the positioning stud before turning the shoulder.

With the help of tool #1 (see page 19), drill the hole for the main spring's rod. This hole, once drilled, is reamed with a rat-tail file to allow easy removal of the rod.

Ejector Base (Drawing 007)

This piece is easily made on the lathe. The only difficulty is in finding the ejector's position, especially if the ejector's channel in the bolt wasn't bored straight. To do this, insert the bolt in the bolt carrier and mount the ejector's base in the rear support ring. Insert the bolt assembly in the receiver (or a tube of the same inner diameter) and put the ring on its rear end. Insert a pointed and hardened 4 mm diameter steel rod into the ejector's channel and, holding the assembly vertically, hit it with a small hammer to mark the ejector's position on the base.

Rotate the ejector base to adjust the rod's position and block it with the rear ring's M4 screw. When you have found the correct position during the final assembly, mark the screw position on the ejector base. Take it apart and file a small recess in it to ensure a positive locking by the screw.

Ejector (Drawing 007)

The ejector is a simple hardened 4 mm rod threaded at its rear extremity. The length of the ejector is critical. If its position is not correct the gun will fail to eject and will therefore jam. Therefore, after the final assembly, test the function with empty cases and dummy cartridges. When the bolt is retracted with enough speed, the empty case should fly away through the ejection opening. If it fails to do so, adjust the ejector's position by screwing or unscrewing it.

Once the correct position is found, fix the ejector on its base with soft solder.

Barrel (Drawing 009)

The barrel is the heart of the gun. It is very difficult for an amateur to make it by himself starting from a plain bar. I do not recommend it, but if you have no other choice, try it, as described in the Expedient Solutions section of this book.

An easier way is to purchase barrel blanks already rifled from industrial manufacturers. Bore diameter must be 8.8 mm to 8.9 mm (.346 to .350 inch), and groove diameter should be 9 mm to 9.1 mm (.354 to .358 inch). The rifling twist should be one turn in 250 mm but may be quite different: the Métral is a fighting instrument and not a precision weapon designed for competition shooting.

The chamber dimensions are critical. I suggest that you use a special reamer (indispensable for large- or even small-scale production). Once cut to the correct dimensions, the chamber must be thoroughly polished.

The conical recess on the rear face helps feed the rounds. It should not go deeper than indicated. If you don't attain these dimensions, the unsupported cartridge wall will split as pressure rises. Fortunately the shooter is well protected from the escaping gases and brass particles, but the weapon will jam with the broken cartridge case stuck in the barrel.

The exterior dimensions are easily turned on a lathe, but pay special attention to the critical length given in the drawing.

You may want to use a longer barrel, to obtain a higher muzzle velocity and greater penetration; you may if you wish.

Barrel Rear Support with Feeding Ramp (Drawing 010)

First, turn and cut a heat-treatable steel bar to the preliminary shape shown in the drawing.

Then, with a milling machine or hacksaw and files, remove the sides of this cylinder.

Drill the two holes for the retaining screws and tap them to M5.

Cut the feeding ramp with a milling machine or a round file.

After the final adjustment, polish the ramp.

Main Spring Assembly (Drawing 008)

The coil spring must be industrially made; therefore, you must purchase this part. If you have difficulties in obtaining a spring of the desired length, you can use a shorter one assembled with the help of the joining ring shown in the drawing.

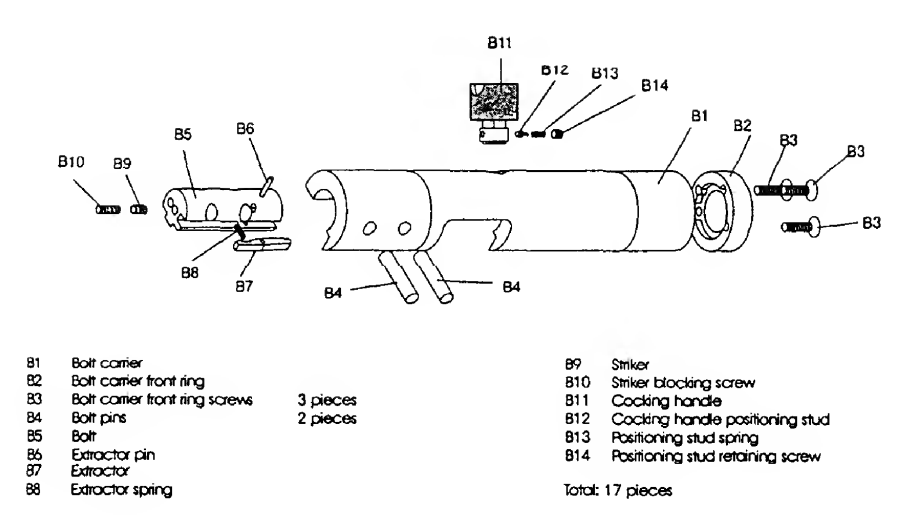
The main spring guide rod is made out of piano-wire-quality steel. Harden it to prevent accidental bending.

Both end pieces are identical, made out of steel and hardened. I suggest fixing them to the rod with soft solder to prevent unscrewing. You may also deform the extremities slightly by hammering, to obtain the same result more quickly.

Group 2: Bolt

Tools

First, make the different tools needed as guides to drill the holes and hold the piece.



Bolt.

Bolt Carrier (Drawing 001 through 014)

I suggest that you build this part in four steps:

Step 1

You need a steel tube of 34/18 mm diameter. It is also possible to bore an 18-mm-diameter hole lengthwise through a 34-mm-diameter plain bar, but it requires a pretty big lathe. You may also choose to make the bolt carrier in three parts, as shown in the Expedient Solutions section of this book.

Cut the lower part away, according to the drawing. To do it, a milling machine is the easiest solution. If you have none, refer to Expedient Solutions.

The next step is to drill the main pin holes. I recommend drilling the carrier and the bolt together in the same operation. To do it, carefully position the bolt to make sure it is horizontal and fix it provisionally to the carrier with a small drop of cyanacrylate glue. Since the axis of the pin is not exactly above the diameter of the bolt carrier, you must prevent the drill from slipping to the side. The surest way is to mill the place flat. If you can't, use a centering drill of 6 mm diameter: slowly guide the fast-rotating drill and penetrate deeply enough to ensure that the full diameter of the drill is enclosed in the metal. Once done you can then use a conventional helical (twist) drill. Another way is to use a wooden drilling guide with a metallic tube liner (tool #2).

Step 2

You must now drill the cocking handle hole with its positioning cuts. Mark the position of the hole, by tracing layout lines with the help of the lathe. Then place the piece on the drill press. To hold the piece in the vise, I recommend inserting it into a tube of 34 mm inner diameter, which may be the future receiver itself. First, drill the 10 mm hole and then enlarge it to 12 mm as shown in the drawing.

With a round file, cut the cocking handle's positioning slots.

Step 3

Cut the ejection opening with a milling machine. If you have none, you can first cut the sides of the opening with a hacksaw. After that, you drill a series of adjacent holes along the length of the opening. You can then cut most of the metal away with a chisel. Finish the opening with hand files or with the help of a small grinder driven by a flexible shaft (flexade).

With the help of the positioning tool (tool #1), mark and drill the three front screw holes and then tap them.

Step 4

Fix the carrier on the lathe with the help of tool #3. You can then turn the recess for the front ring and diminish the diameter of the bolt carrier as shown in the drawing to reduce friction.

Bolt Carrier Front Ring (Drawing 015)

This part of the bolt requires a heat-treatable steel and must be hardened. The easiest way is to purchase a bar of 34 mm diameter and then cut it to length.

Next locate and drill the four holes with the help of the guiding tool (tool #1). Then drill the countersink for the three screw heads.

Take the ring on the lathe and turn the inner 24 mm diameter recess.

Cut the main spring abutment place either with an appropriate tool or file it off.

Finally cut the opening for the main spring guide rod.

Bolt (Drawing 017)

If you have access to a milling machine, I suggest that you first mill a 18-mm-diameter steel bar to the preliminary shape shown in the drawing. The bar should be long enough to make four to five pieces or more. If you don't have access to the right equipment to do this, refer to Expedient Solutions.

Take the piece on the lathe and drill the firing pin hole all the way through.

Mark the ejector hole position on the lathe (layout lines) and drill it on the drill press. Because the drill may wander, begin from the front face.

Next drill the holes for the extractor axis pin and spring.

Put the bolt back on the lathe and turn the cartridge head recess out. Then tap the firing pin hole.

I suggest that you drill the main pin's locations together with the bolt carrier, as described above.

Main Pins (Drawing 016)

Make these parts out the toughest steel you can obtain. For the prototype I used DIN 34 CrNiMo 6 steel heat treated to 980-1,180 N/mm^2 resistance.

You must take care to work according to close tolerances because these pins should not move freely in their locations, but rather should be hammered in place (a press fit).

Extractor (Drawing 018)

This small piece is made out of tough heat-treatable steel. If you are building a single gun, or just a few, you will have to adjust it by hand-filing. The extractor should engage the cartridge head smoothly to prevent losing too much energy from the slamming bolt. Therefore, keep the lower angle of the hook under 45°.

The extractor's axis pin is made out a 2-mm-diameter piano wire. The axis pin is inserted from above, and its superior end deformed by hammering to prevent it from falling.

The coil spring is made out of standard commercial stock.

Firing Pin (Drawing 018)

Use a headless M4 Allen screw and turn it to shape. This piece must be hardened. A commercial M4 Allen screw located just behind blocks it in the correct position.

Cocking Handle (Drawing 019)

This part is easy to make on a lathe and does not require special instructions. Take special care to cut the flat sides exactly parallel with the positioning stud hole.

The only function of the two cuts on the superior (fatter) part is to indicate the cocking handle

position ("safe" or "fire") at night. You can choose another solution if you want; for example, you can file one side flat. You may also use a steel ball in place of the positioning stud. In this case crimp the opening with an appropriate tool.

Group 3: Trigger Mechanism Housing

Housing (Drawings 020 and 021)

If possible, use a 30/30 mm U steel profile, 2 mm thick. You may also work from a square 30/30 mm tube and remove the side with the seam.

Cut the openings with either a file or a milling machine and drill the holes on the drill press.

You may want to build a semiauto-only version of the gun. To do so, just limit the length of the selectors cut to 46 mm. instead of 51.5 mm for the full-auto version.

Front and Back Plates (Drawing 022)

The front and back plates are made out of 5-mm-thick soft steel. Take care to correctly adjust the rounded cut to the gun's body. The plates are then welded to the housing.

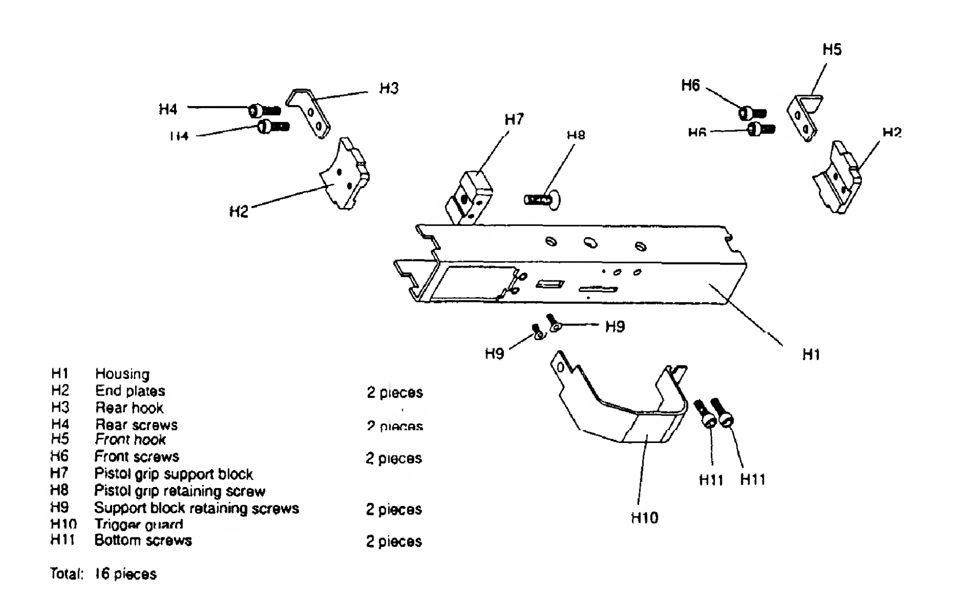
Hooks (Drawing 023)

These two parts have the very important task of holding the upper and lower parts of the gun together. They must be hard enough to resist deformation in spite of many repetitions of assembly and disassembly. Therefore, do not use soft steel sheet; choose a tough alloyed brand. Forge and control the adjustment by assembling the trigger mechanism housing to the receiver.

After this, the hooks are hardened and tempered.

Welded Brackets (Optional) (Drawing 064)

If the quality of the steel you are using for the hooks isn't high enough, use the welded bracket solution, described in Expedient Solutions.



Trigger mechanism housing.

Trigger Guard (Drawing 025)

The trigger guard is made out of 1.5 mm steel sheet and must be bent with the help of a vise.

If you're building a series of guns, I recommend making a male forming die out of hardwood or any suitable material and bending the sheet around it.

Group 4: Trigger Mechanism (Drawing 026 through 032)

Small Parts

Make the sear, sear plunger, disconnector, selector, and axis pin (T6) out of tough heat-treatable steel. The trigger arm can be made out soft steel, as can the trigger itself and the rivets (T3). These parts are relatively easy to build with files, a drill press, and a lathe.

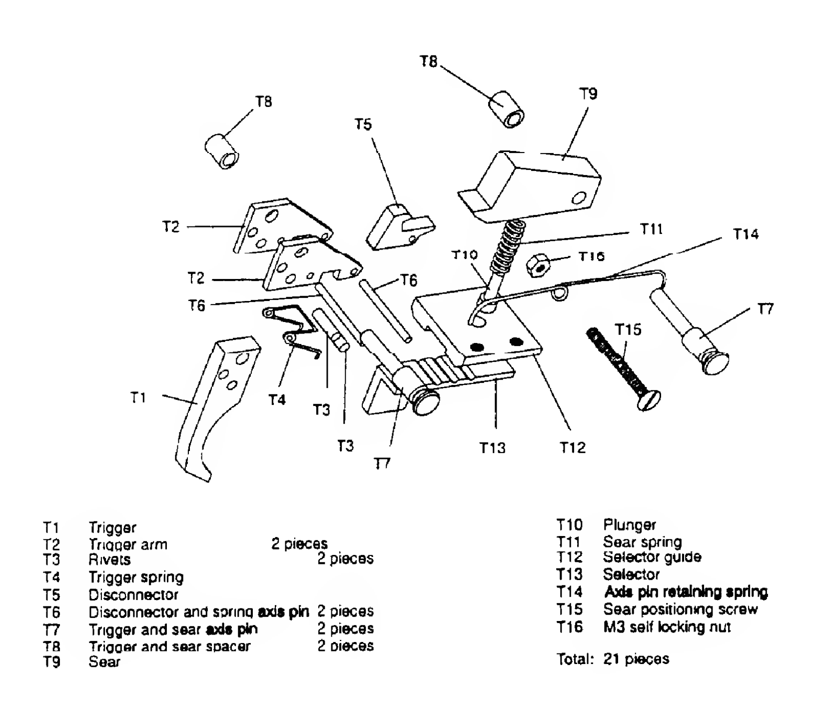
The front side of the trigger should be rounded to make it more comfortable for the finger.

Adjust the disconnector hook and the sear. For small- or large-scale production use the test bed shown in drawing 052 at the back of the book. The length of the sear's arm shown in the drawing is intentionally oversized (but just a little bit) to allow fine adjustment with a file.

Trigger and Sear Axis Pin

These two pieces are interchangeable and made out of heat-treatable steel. They are held in place by a small spring engaged in their groove, as shown in illustrations. This spring is made out of 0.5-mm-diameter piano wire. It is held in place between the side of the housing and a self-locking nut, on the transverse screw limiting the movement of the sear. This screw should be hardened if possible.

The trigger and the sear are maintained in place on the other side by the small cylindrical spacer (T8).



Trigger mechanism.

Group 5: Pistol Grip (Drawing 024)

You can either build the pistol grip with a folded steel sheet and wooden or plastic side plates, or make it completely out of plastic.

For mass production the best solution is, of course, a molded hard plastic grip, with or without metal inserts depending of the kind of plastic used. An injection mold requires special equipment and a large investment in the mold's design and construction. Since this gun isn't designed for industrial mass production, directions for molded plastic grips are not given here.

You may choose either to cast a resin and fiberglass grip or build a conventional steel sheet one, with wooden side plates. The steel sheet version will be described here; for the resin and fiberglass version see Appendix A.

Construction

First cut a 1.5 mm steel sheet to the correct dimensions. Inside dimensions are critical; therefore, you must first make a form block corresponding to the magazine you are going to use. Drawing 033 gives the dimensions for a STEN magazine.

To build a single piece, use the form block of drawing 033 and a vise. For small-scale production use the forming die shown in drawing 051.

According to the equipment you have available, braze or weld the rear lips together.

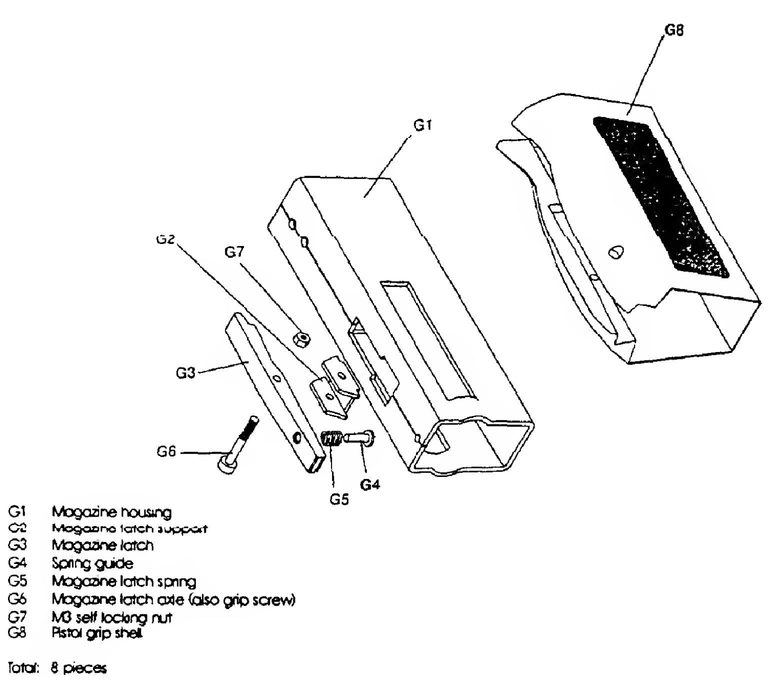
With a hammer and an anvil, with (better) or without the help of a torch, deform the small bridges at the lower end of the magazine housing to build the passage for the magazine depth stops.

Then make the small U-shaped piece to support the magazine catch. Drill the holes for the magazine catch's axis pin. Weld or braze it to the grip.

Try to insert the grip in the trigger housing; some adjustment with a file may be necessary.

Try to insert the magazine; adjust as needed with a file. The magazine should be able to be inserted and removed without force.

At this point verify the position of the magazine on the gun, but take care: it is the most essential adjustment to ensure a smooth feeding and positive ignition of the cartridge. The magazine's lips must not touch the bottom of the bolt but should be as high as possible. The bolt must strip the round from the magazine to push it into the chamber. Try it with a dummy cartridge. You may adjust to get the correct position by filing the top of the side slots. If you have already gone too far, pull the pistol grip out. Once you have found the correct position, mark the locations of the retaining screw's holes, and drill them.



Pistol grip.

Magazine Latch (Drawing 035)

The magazine latch is made out of a square heat-treatable steel bar. I recommend that you file the top part during the final adjustment operation, because the magazine position is critical to prevent jamming while feeding the rounds.

Magazine Latch Spring (Drawing 035)

The spring is a conventional commercial compression coil spring. You may use the same brand as the main spring.

The spring guide is maintained in place on the magazine latch by a small deformation of its end formed by hammering. It should be done only after the magazine latch has been hardened.

Side Plates (Drawing 036)

Both should be made out the same hardwood. Walnut is the best choice, but you may use another.

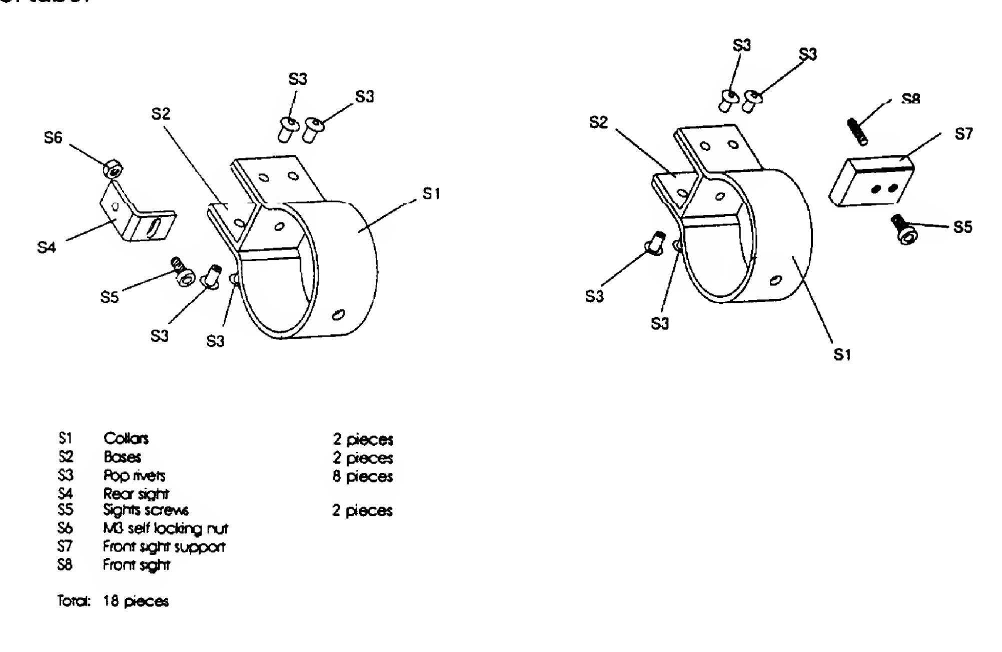
You should first machine the wood to the preliminary L-shape shown in the drawing. The piece is then formed with a saw and the help of a template.

For the prototype, I used the following solution. Resin-impregnated glass fabric formed the front and inner sides of the grip, and the wooden side plates were epoxied onto it. The separation between the two wooden halves was left free, so the finished grip could open like an oyster at its rear side (see Illustration G). Finish it with a rasp and a buffer.

The retainer screw acts also as axis pin for the magazine latch. To drill its location, put the wooden left side plate in place on the pistol grip and use the axis pin holes as guides. Proceed the same way for the right side. Now you have to drill the recesses for the screw head on the right half and for the nut on the left half. I suggest using a self-locking nut.

Group 6: Sights (Drawing 037 through 039)

The front and rear sights are both made out of the same basic module. To build the basic module you need a U-shaped steel profile 20 x 20 mm, 2 mm thick. You can also make it out of 20 x 20 mm square steel tube.



Sights.

Drill the holes for the rivets in the U profile and one extremity of the strip.

Bend the metal strip with the help of tool #4.

Mark the position for the rivets on the strip and drill them. You must ensure a tight adjustment around the tube. Then rivet the two pieces together.

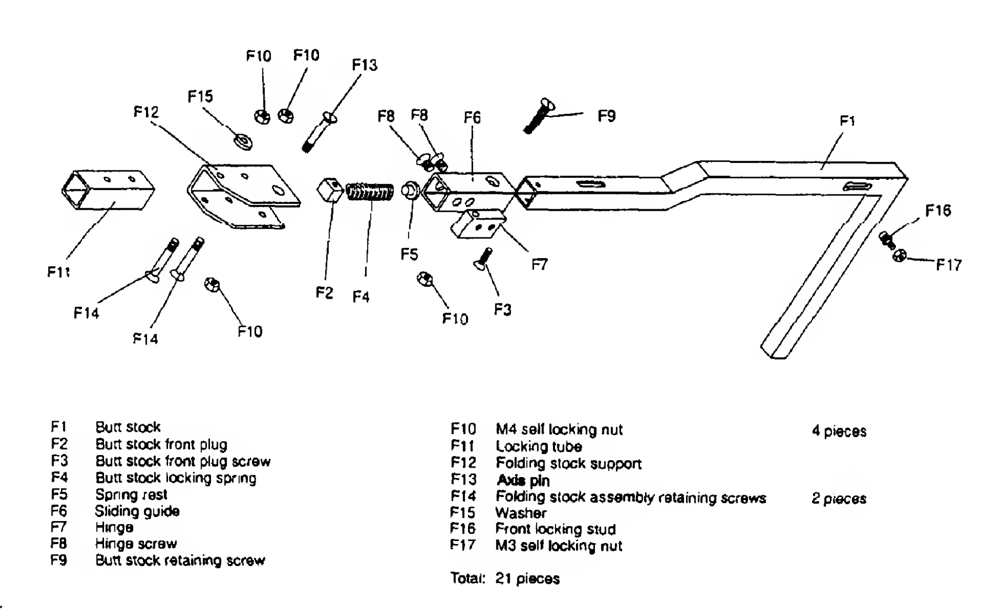
The parts specific to the front and rear sights are very simple and are self-explanatory.

The front sight is assembled on the gun, with a screw inserted through the gun's receiver. *Caution*: This screw should not protrude inside the receiver.

The rear sight assembly is made according the same principles.

Group 7: Folding Stock (Drawing 040 through 043)

The folding stock is made out of commercial square tubes. The only difficulty is that the stock itself must slide smoothly into the rear tube, but not be loose. You have to be careful if you're going to adjust it with a file.



Folding stock.

I suggest that you wait to install the retaining stud on the trigger mechanism housing until the final step. The stock should engage the retaining stud when pushed in its foremost position. Releasing it will let it return under spring pressure and be locked.

When firing at the hip, the shooter uses the stock butt as a foregrip. Since the grip is located to the left of the gun's axis, pulling on it will counteract the tendency of the weapon to climb to the right during automatic fire.

Group 8: Handguard and Front Grip (Drawing 044 and 045)

These parts may be made either from hardwood or some kind of plastic material.

Drawing 044 shows one of the simplest and easiest wooden solutions. You may, of course, choose another better-looking one, which would require more time to manufacture.

As for the pistol grip, I suggest reinforcing the inner surfaces with glass bedding.

Group Tools

Tool 1 (Drawing 046)

This template doesn't require special comments.

Tool 2 (Drawing 047)

This tool is only necessary if you have no milling machine. Use hard plastic, as indicated, or hardwood for the block. Fasten the steel liner to the block with epoxy or similar adhesive.

Tool 3 (Drawing 048)

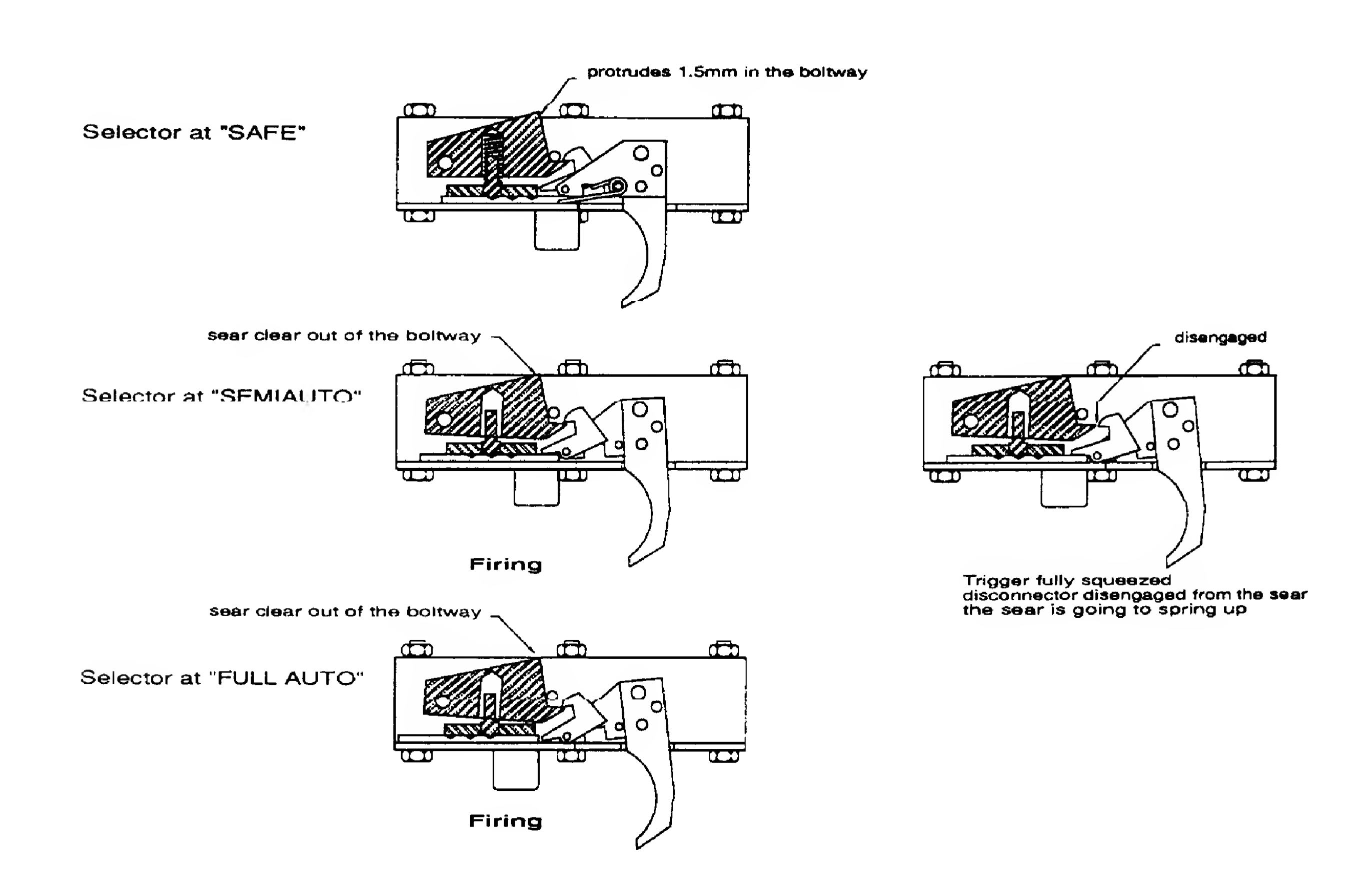
This device is useful for the fourth construction step of the bolt carrier. You may use brass instead of steel.

Tool 4 (Drawing 049)

This device is very useful to bend the sights' collars, with the help of a hammer and a vise.

Dummy Round (Drawing 050)

These dummy rounds are used first without primer to test feeding, extracting, and ejecting operations. You will test the ignition with primer. Use a fired cartridge case resized with an appropriate reloading tool. Primers are commercial reloading components.



Functioning of the trigger mechanism, shown on the test fixture.

Tool 5 (Drawing 051)

This tool is designed for small-scale production of the magazine housing. It is to be used with the help of a heavy vise.

Trigger Mechanism Test Bed (Drawing 052)

The test bed is useful for small-scale production. Use the spacers (T8) to position the sear and trigger assembly.

TESTING

TRIGGER MECHANISM

First adjust the trigger mechanism on the trigger mechanism test fixture (Drawing 052). When the mechanism works correctly, assemble it in the trigger mechanism housing and pistol grip assembly.

With the selector at the rear position, it should be impossible to move the trigger. With the selector at the middle position, you pull the trigger and the disconnector lowers the sear until it is brought back out of engagement; the sear then springs up. Once the trigger is released it springs forward and the disconnector snaps on the sear's arm. With the selector at the foremost position, you pull the trigger all the way back. The disconnector remains engaged to the sear. If things don't work that way, adjust with a file.

Now assemble the trigger mechanism housing to the receiver without the bolt and barrel. Don't use the front plug and hold the two parts together with your hand. Looking from the front of the body, observe the sear. As you pull the trigger with the selector (in both semiauto or full-auto position) the sear should completely clear the bolt way, but return high enough to catch the bolt once the trigger is released or the disconnector disengaged. If necessary, adjust the sear. Then assemble the gun completely, with bolt and barrel.

Retract the bolt to its firing position. With the selector set at semiauto, pull the trigger to let the bolt fly forward and, without releasing it, pull the bolt handle all the way back. The bolt should remain to the rear. If you release the trigger, it will return to the firing position, and, if you pull it again, the bolt will fly forward. If the selector is set at full auto, the bolt will not remain at the rear during that operation. If your gun doesn't work that way, you will have to adjust the point of contact between the sear and the bolt.

FEEDING AND FIRING OPERATIONS

I recommend first using inert dummy rounds to test the feeding and firing operations. Load one inert dummy cartridge in the magazine and fire. The gun should chamber the round smoothly. Sharply pull the bolt handle all the way back, and the round should fly away through the ejection port. Inspect the case for any abnormal sign of wear; for example, on the rear face where the extractor snaps on the cartridge head. If necessary, adjust the magazine position; next check the feeding ramp or extractor's angle. You may also have to correct the ejector's position by screwing or unscrewing it.

Once the gun feeds and ejects inert rounds correctly, test it with primer-only dummy rounds. These rounds are useful to test the ignition process in the workshop, without necessitating a trip to the shooting range. But be careful: primer projections can be dangerous; don't fire in the direction of any living being. If you can't purchase primers, you will have to test with live rounds.



Above: Firing at full auto.



Top right: Accuracy testing at the shooting range.



Right: Testing at 25 meters at the range.



Above: Results of five shots shoulder-fired on semiauto in 10 seconds at a distance of 25 meters.

When selecting a place to test the gun with live rounds, you must pay attention to the ordinary security measures usual with handgun shooting. Keep in mind also that any submachine gun recoils during full-auto fire and that the bullets tend to go to the right and up.

There is only one danger when you fire the gun for the first time, but it is serious: if the cartridge chamber in the barrel hasn't been reamed to the correct dimensions, there is a possibility of premature ignition. The cap will be crushed by the firing pin before the round is fully chambered, and the unsupported rear part of the cartridge case will split. Small brass particles will fly through the ejection port, which is dangerous to the eyes. You must wear protective goggles and keep any bystanders away from the right side of the gun.

First load only one round, set the selector at semiauto, aim, and fire. If all works correctly, the gun will fire, the empty case will be ejected, and the bolt will remain to the rear. Check the ejected case for any abnormal deformation.

If the gun fails to eject, modify the ejector's position.

If the gun fails to fire, check and eventually modify the firing pin or the extractor.

If the bolt is not caught by the sear, check the trigger mechanism again (see above). If all seems correct there, the problem may come from weak ammunition, a stiff main spring, or too much friction during the bolt's travel. Determine what is causing the malfunction and make the necessary modifications.

If everything worked correctly with a single round, load three cartridges. Fire them on semiauto. Try with five rounds and then a full magazine. Be careful: there is a small risk that the amount of friction generated by the magazine spring under full pressure will not allow the bolt to travel far enough to the rear to be caught by the sear; the gun will then fire some rounds at full auto. If that happens, modify the gun by thoroughly polishing the underpart of the bolt and the contact surfaces of the bolt carrier. The moving parts should be well lubricated.

When the gun functions correctly at semiauto, test it at full auto, first with a few rounds and then with a full magazine.

MAGAZINE

Because magazines may come from various manufacturers and may be in questionable condition, test the gun with many of them and discard those that cause problems.

SIGHTS

Zeroing the sights should be done at the shooting range. The elevation is corrected by screwing or unscrewing the Allen screw that acts as front sight. Side deviation is corrected by laterally displacing the L-shaped back sight.

I suggest a rough adjustment at 10 meters and a fine tuning at 25 or 50 meters. Once adjusted, the back sight is secured by the self-locking nut, and the front one by a drop of epoxy.



FINISHING

PLUGS

With the help of a micrometer, find and mark the location of the hole for the positioning stud on the front and rear plugs.

HARDENING

Harden the following pieces:

- sear
- trigger and sear axis pins
- disconnector
- bolt front ring
- extractor
- ejector
- striker
- feeding ramp
- magazine latch

After being hardened these parts must be tempered.

POLISHING

Giving a gun a good-looking finish can take a lot of time, primarily because of the polishing operations.

This submachine gun isn't a decorative item to be hung on the wall of your living room. In fact, it is probably an illegal fighting weapon that should be hidden most of the time. Therefore, don't spend too much time on the finishing.

The only thing that you must do is to treat the metal and wooden parts to protect them against humidity and rust.

WOODEN PARTS

The wood is first well polished. Unless the wood is very dense, a filler should be use to fill the

pores. After drying, the excess filler is removed with fine sandpaper. To treat the wood, then apply protective oil or another currently available high-quality product according to the manufacturer's directions.

METAL PARTS

You may choose between a conversion coating (such as bluing or Parkerizing) and a paint coating. Until recently, paint was seldom used for firearms, but now more and more military weapons are protected with new very resistant synthetic coatings. I highly recommend using paint because of the wide availability of high-quality and relatively cheap commercial products.

For the prototypes I used a black high-temperature-resistant paint designed for automobile exhaust pipes. The paint was also resistant to the lubricating grease and oil used on the gun.

The traditional finish used in the small-arms industry is a conversion coating, by which the surface of steel is converted to a rust-resistant iron compound. You may choose between the bluing process, which creates a microscopic sheet of black ferrous oxide, and phosphatization, which gives gray iron-phosphate. If you prefer a conversion coating, please refer to Appendix B.

SLING

You can easily make a sling to carry Métral submachine gun around if you like. There are any number of books that tell how to fashion a sling, so there is no need to provide instructions here.



A leather or nylon sling may be added.

PLUGS WITHOUT THREADING

The solution shown in drawing 053 was tested, and it is usable but not recommended. The removal of these plugs is not as easy as with threaded ones. To do it you will need the takedown tools shown in the drawing. Use them to push the retaining studs inside and jerk the plug slightly until the studs are disengaged from the holes in the receiver walls. Then pull the plug out with a gentle jerking motion, alternatively clockwise and counterclockwise. Be careful to avoid a too wide rotation that could distort the main spring rod.

Because threading on a lathe is no more difficult than correctly drilling the holes for the studs, use the latter solution only if you absolutely cannot thread the plugs and gun receiver.

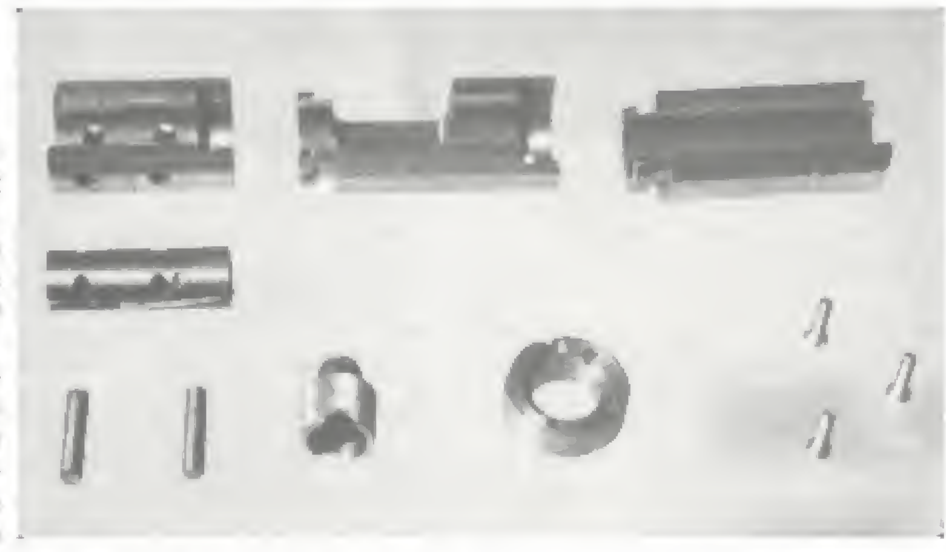


Improvised prototype, including plugs without threading, welded bracket, and plastic pistol grip (top) compared with the standard prototype (bottom).

BOLT CARRIER: HOW TO BUILD IT IN THREE PARTS

If you can't find a 34/18 steel tube and can't bore it in one operation, you can make it in three parts and append them, as shown in Drawings 059 through 062.

I used screws to assemble the parts for the prototype, but you can weld or rivet them together. If no milling machine is available, use the preliminary shape shown on drawing 059. Use tool #3 to turn the bolt carrier diameter down to 34 mm.



Three-part bolt carrier, with bolt and handle.

BOLT

Drawing 063 gives a solution for cutting the preliminary shape if no milling machine is available.

WELDED BRACKETS

If the steel quality you are using for the hooks isn't good enough, use the welded bracket solution, given in drawing 064. Be careful to prevent any deformation of the receiver during the welding operation.

HOW TO RIFLE A BARREL

You will find a complete description of the process in *Home Workshop Guns for Defense and Resistance Volume 1: The Submachine Gun* by Bill Holmes (available from Paladin Press). For those who don't have access to this book, I will recap the main steps.

Start with a plain bar. The first and perhaps biggest difficulty is to drill it straight. Then you have to ream it to a diameter of 8.80 mm.

Then rifle it, cutting two or four grooves with a twist of one turn in about 254 mm (10 inches). Military barrels during World War II were often made with only two grooves, which proved to be sufficient.

To rifle the barrel you have to build a rifling bank (bench), as shown in the accompanying photo.



The author operating the rifling bank (bench).

As a guide, use an old rifle barrel. To drive the cutting tool, I cast a lead slug around the notched part of a rifle cleaning rod inside the bore of the guide barrel.

After testing the hook-type rifling head described in the above-mentioned book, I made an improved rifling head, shown in drawing 065, that is easier to build and operate.

To use it, begin with the depth-controlling nut screwed into its foremost position, which brings the cutting tool into its lowest position. Unscrew the nut until the cutter comes in contact with the barrel wall. Then pull the cutter completely through the barrel and push it back. Remove the cutter from the upper slot and insert it in the lower slot. Pull the cutter through the barrel again and push it back. Then unscrew the nut one-quarter of a turn; this will allow the cutter to go 0.01 mm higher. Pull the cutter through the barrel again and push it back. Then remove the cutter from the lower slot and insert it in the upper one. Repeat these operations until the desired groove depth is obtained. For a 9mm Parabellum barrel, the groove diameter will be 9 mm to 9.1 mm. By using the same cutter with the same depth control for both grooves, you are sure to obtain a perfectly symmetrical rifling. Don't forget to use enough lubricant.

After the bore is rifled, it should be lapped to remove any chips left from the tools. The description of the operation given in Bill Holmes' book is as follows:

> This may be done by casting a lead slug, some two to four inches long, around a rod inside the bore. Push the slug almost all the way out of the bore and coat it with a mixture of oil and fine emery flour. The unoccupied portion of the bore should also be coated with oil through the opposite end. A stop should be inserted in each end of the barrel to insure against accidentally pushing or pulling out the lapping plug. This plug should never be removed from the bore until its work is finished. The lap should now be pulled (and pushed) back and forth through the bore for about 10 minutes, with additional abrasive and oil being added frequently. After the lap is removed, the barrel should be cleaned thoroughly with gasoline and patches and then examined. If more lapping is needed, the old lap should be melted off the rod and a new one made. Do not try to put the old lap back in the barrel.

SILENCER

The Métral gun will accept a silencer without your having to do major modifications. The only thing you must do is add another front plug to which the silencer can be affixed.

Two different silencer versions are presented here. They are both compromise solutions incorporating known principles, and both were tested and found to be reasonably effective. The bullet remains supersonic, and the mechanical noise of the slamming bolt isn't lessened.

You must not expect your silenced gun to emit only small "plops" as shown in movies. Even the best silenced gun won't do that. However, the suppression you'll achieve with either of these silencers is sufficient to make it extremely difficult to determine the point of origin. In a noisy environment, such as a big city, most bystanders wouldn't even be aware that someone had fired.

A silencer is useful for testing the gun without alarming the neighbors, but its main purpose is for commando-style operations or assassinations. Therefore, most countries either forbid their citizens to own silencers or severely restrict their ability to do so. So be warned again: if you build one, it will almost surely be illegal.

VERSION ONE: SILENCER WITH RUBBER BAFFLES (DRAWINGS 066 AND 067)

This model is slightly more efficient than version two, at least for the first five shots. The rubber



(Top) Ingram M10 with MAC silencer. (Below) Métral submachine gun with the prototype of the version one silencer.

baffles soon wear out, and after about 15 shots this silencer begins to be louder than version two.

As with the World War II silenced STEN gun, you should fire semiauto only.

VERSION TWO: SILENCER WITHOUT BAFFLES (DRAWINGS 068 THROUGH 070)

This model is designed to allow a longer use than the former version without loss of performance.

Cross section of .45-caliber Bell Laboratories' silenced M3 submachine gun barrel.

The main working principle is absorption of the propellant gas energy by heating the wire mesh located in the expansion chambers. It was used during World War II with success in the silencer for the U.S. M3 submachine gun ("grease gun"), and since that time has been used in many other silenced weapons.

The middle pressure chamber is my own invention. Its function is to slow down the escaping gasses. It works like an inverted smoke extractor such as those used on tank guns. I didn't do any testing to find out if this system is very effective. It is just a suggestion to carry on further research.

To remain effective the silencer must be thoroughly cleaned periodically, especially the wire mesh. Spray carburetor cleaner works well.

As with version one, avoid full-automatic fire.

FURTHER ADVICE

You may obtain a better silenced submachine gun by using subsonic ammunition and a lightened bolt carrier. The lightened bolt carrier is made by drilling large holes through its left side. Something else to explore is the use of helical channels, as found in the British L34A1 Patchett/Sterling gun or in the Sionics silencer for the Ingram M10 gun. Such silencers are a little more complicated to build, but they are more effective and easier to maintain.

CLANDESTINE LARGE-SCALE PRODUCTION

BASIC PRINCIPLES

These basic principles can be explained by the following joke, believed to have been originated by Jews in Palestine during the last months of the British mandate.

> A poor man was working in a plant named Sewing Machines, Inc. He wanted to give to his wife a sewing machine but had no money to buy one, so every evening he'd smuggle home a different piece that his factory was making.
>
> After many days his home stock was complete, and he tried to assemble the machine for his wife. He tried many times, but he always ended up with a machine gun.

A clandestine resistance organization needs considerable quantities of weapons. The importation of complete guns may be difficult and costly, and a single police operation may undo months of effort. Such an event happened to the Irish Republican Army, when on 30 October 1987 the *Eskund II*, a ship loaded with tons of Libyan weapons was intercepted by the French authorities.

The method suggested here consists of a decentralized mass production of harmless metallic pieces that may be used for various purposes. All machining operations requiring heavy machine tools are completed at this stage. The parts are then dispersed in several small workshops where they can be completed without special tools or skilled labor.

COVER

The clandestine organization needs efficient cover to buy large quantities of metallic components without alarming the authorities. The only way to do this is to control at least three small or middle-sized industrial plants used for subcontracting work and with a regular output of some kind of mechanical devices.

You must have a net of interconnecting enterprises devoted to the decentralized production of mechanical devices. The idea is that the orders and movements of the gun components will be completely hidden in a stream of civilian goods.

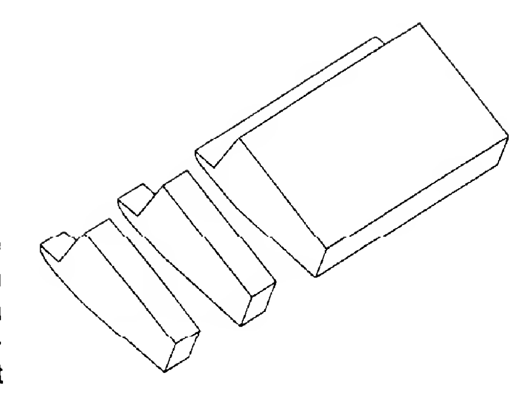
It is also assumed that you observe all the basic rules of security for a clandestine organization.

PRODUCTION SCHEME

Many components of the submachine gun could belong to any civilian mechanical device, and no

one would likely suspect their final destination, at least in their half-finished state. I call these elements "general-purpose pieces." The clandestine organization may order them from ordinary factories. The springs used in the gun are good examples of such pieces, as are the plugs and support rings.

Other components are to be made in two steps. First a bar is machined to the correct profile in an industrial factory. The longer the bar, the better the camouflage. These bars are then dispersed to the smaller workshops, where they are cut like an Italian salami. Most of the resulting rough cuts require only a few drillings to finish the piece. I call these parts "salami-principle pieces." The sear, the bolt, and even bolt carrier are such pieces.



An example of a "salami-principle" part, the sear.

The receivers and trigger mechanism housings are taken from commercial steel tubes and U iron, which appear innocuous. Once the work has begun, it will be difficult to conceal the parts' ultimate function. Fortunately, this phase is done quickly, even in small workshops. For your security, you must remove the pieces from the workshop as soon as they are machined.

The pistol grip, either in its metallic-and-wood or plastic version, is a compromising piece. You have to build it in a secure place. Because it doesn't require special machine tools, it is possible to manufacture it in private homes.

The barrel is the most critical part of the process. For accuracy, a gun must be rifled. As indicated above, it is possible to rifle a barrel with primitive tools, but this is inadequate for a large-scale production. You must therefore find a way to smuggle industrial barrels. I recommend importing finished barrels whose cartridge chambers have already been machined. To smuggle these components, it is wise to use the ant strategy; i.e., import a small number of pieces over and over. It will minimize the loss in case of interception and deflect suspicion of a large-scale operation. Barrels can be easily concealed in metallic pipes, imported as bars, or hidden in a truck chassis.

Magazines should also be purchased from industrial sources.

Final assembly should also be done in a secure place. Since the quality of manufacture is very difficult to control under clandestine conditions, only after the final assembly will it be possible to test whether the guns work or not. Therefore, you must have a place to fire the guns, without alarming the neighborhood, with an adjacent workshop to make the final corrections.

An important element in this production scheme is the distribution of jigs and tools to the various manufacturers, especially for the small pieces.

A

HOW TO MAKE PARTS WITH RESIN AND GLASS FABRIC

The following text describes how to make parts with epoxy resin reinforced with glass fabric, using a silicone rubber mold.

Make a master form. You may use wood, wax, clay, or any other easy-to-form material. The pistol grip is to be made in two parts.

Make a mold in two parts and use it to reproduce as many copies of the master as you want. Use a suitable silicone rubber elastomer.

1. *Preparation*
   —Prepare a box or simple frame for the mold.
   —Put a layer of modeling clay in the base of the box.
2. *Bedding*
   —Place the object in modeling clay.
3. *Positioning*
   —Make a few 3- or 4-mm holes in the modeling clay to enable you to put the halves of the mold together. Put in a tube about the width of a pencil for the feeder channel. Another tube is necessary to evacuate the air.
   —Coat with a thin layer of petroleum jelly.
4. *Pouring the first half*
   —Catalyze the silicone rubber and pour it into the mold. Wait for the elastomer to cure.

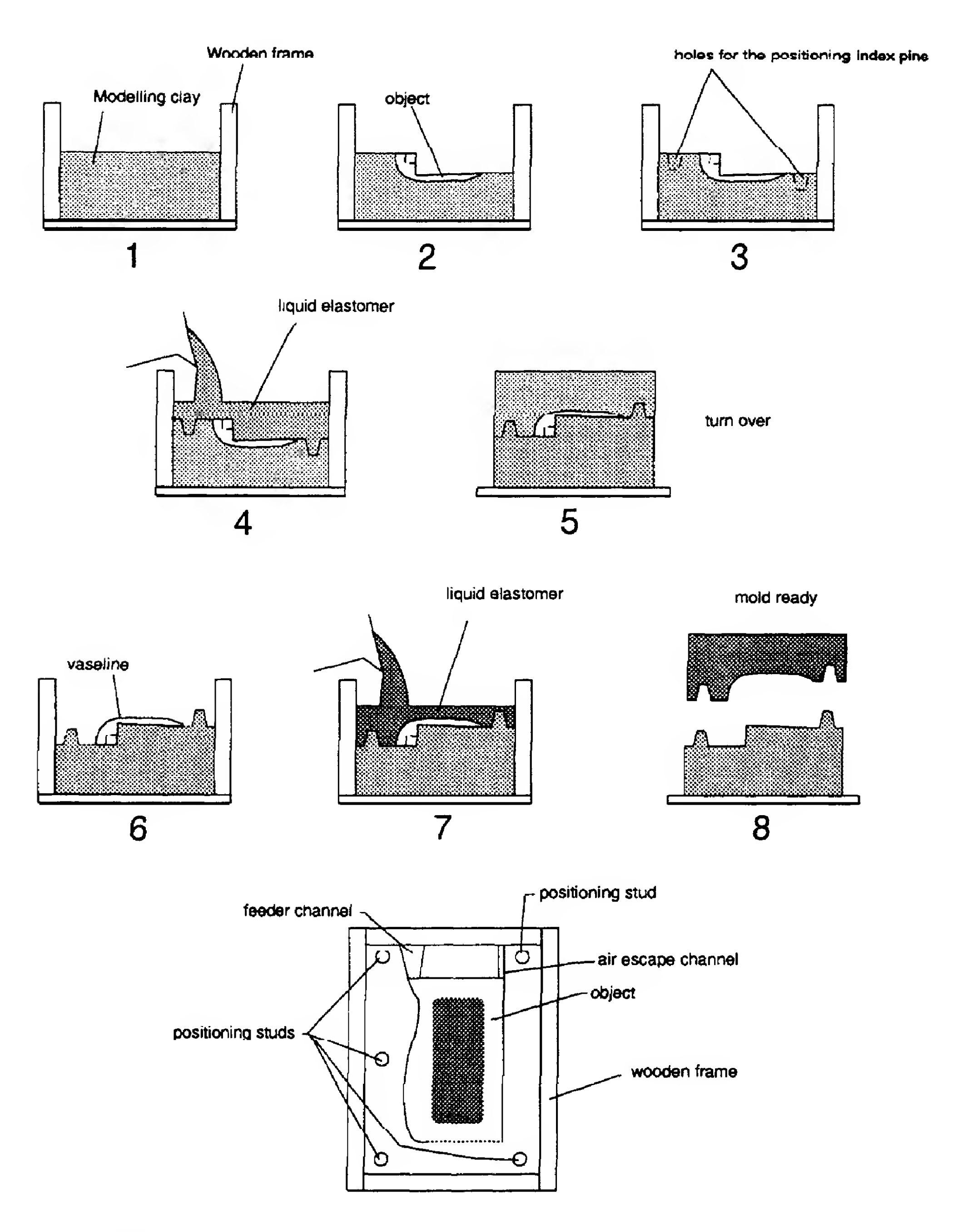
5–6. *Turn over*
   —After curing, invert the mold, and remove the modeling clay completely.
   —Put a thin layer of petroleum jelly on the first half of the mold and the model.

7–8. *Pouring the second half*
   —Catalyze the silicone rubber and pour it into the mold. Wait for the elastomer to cure.
   —Separate the halves, remove the tube to form the feeder channel, and remove the master form.
   —Clean the parts. The mold is now ready.

TO REPRODUCE

- Cut the glass or Kevlar fabric to the correct dimensions.
- Impregnate the layers one after the other with catalyzed epoxy resin and put them into the mold.
- Carefully put the halves of the mold together.
- Pour the epoxy through the feeder channel to complete the filling.
- Wait until polymerization occurs and the resin hardens.
- Open the mold: the molding will be a faithful reproduction of the original, and the mold is ready for further reproductions.

How to make a mold in Two Parts



How to make a mold in two parts.

SURFACE TREATMENT: CONVERSION COATINGS

Bluing is the most common treatment for civilian weapons and, outside America, for military arms. In this country the phosphatizing process (Parkerization) has been more widely used for steel military weapons.

For all three methods given below, use iron or steel tanks that are long and wide enough to accept the gun's body. These tanks must not be galvanized, and the seams should be welded, not brazed or soldered. For a heat source, use gas burners.

Because grease is the worst enemy of the iron surface conversion process, be sure not to touch the pieces with your fingers. Use boiled cotton gloves or surgical rubber gloves. Make small wire-screen baskets to handle the small pieces. Also prepare iron wire holders to suspend the large pieces, such as the barrel, receiver, trigger housing, and magazine housing.

Always work in a well-ventilated working place or in the open.

BLUING

There are various methods of bluing, but I will give only two: hot salt bath and hot water.

Hot-Salt-Bath Bluing

This is a quick, professional process recommended for bluing a large number of pieces. However, because it uses highly caustic chemicals, it does require strict adherence to safety precautions to avoid accidents. It is highly caustic and hazardous to the skin and the eyes.

Warning: Bluing should never be done if sulfur is present. This bath is very aggressive and will destroy solder, silver solder, copper, brass, aluminum, zinc alloys, and organic materials.

The parts must first be thoroughly polished and degreased (e.g., with trichlorethylene, TCE). [Editor's note: TCE is virtually unobtainable in the United States because of Environmental Protection Agency regulations. Methyl ketone is a fair substitute for TCE.]

It is sometimes recommended that you etch the parts by immersion in a 10-percent solution of nitric acid (HNO_3). After acid etching, the parts should be thoroughly rinsed in distilled water.

The solution is heated to the boiling point and kept at a gentle boil, which means a temperature of 290–295°F (143–146°C). If the temperature rises, add a small amount of water; allow some to boil away if the temperature gets too low.

Bluing is done by immersing the thoroughly degreased parts in the bath for about 30 minutes. After bluing, the parts are rinsed in hot pure water.

Warning: The description above contains only the main steps of the process. Amateurs should not work with these dangerous chemicals without aid of further references or more experienced helpers. Books describing the entire practical process are given in the Bibliography.

FORMULA FOR HOT-SALT BLUING	Ounces		Grams
Sodium hydroxide ($NaOH$)	65	=	1,843
Sodium nitrate ($NaNO_3$)	17	=	482
Sodium nitrite ($NaNO_2$)	4	=	113
Trisodium phosphate (Na_3PO_4)	2	=	57
Distilled water	134	=	3,800

Hot-Water Bluing

This is the safest bluing process for amateurs.

Parts are polished, degreased, and eventually acid-etched as in the hot-salt bluing process.

Bluing is done in a sheet-metal tank, large enough to immerse the largest parts of the gun. The tank will be filled three-fourths full of water and placed over a heat source that will keep it at a hard, rolling boil. A wide-mouthed jar should be placed near the tank, provided with a clean cotton swab on the end of a wood dowel. Some of the bluing solution is placed in the jar.

The gun parts are placed in the tank and boiled for perhaps 15 minutes. They aren't hot enough unless they will dry immediately upon removal from the tank. When they are that hot, remove one part at a time, keeping it very close to the top of the tank. Swab it all over with the bluing formula, using long, uniform strokes. As quickly as the solution dries, immerse that part in the tank. Repeat this on all parts. Then remove each part in turn from the tank and use a wad of steel wool to lightly remove any rust that has formed. Repeat the entire process approximately eight times, or until all parts have taken on a uniform dark-blue color. Finally, boil the parts thoroughly in a bath of distilled water and then dry and oil them.

Warning: nitrates and chlorates are oxidizing chemicals that may be used to prepare explosives. Mercury is a heavy metal and a dangerous pollutant. For these reasons, the above chemicals are difficult to obtain without authorization in many countries.

FORMULA FOR HOT-WATER BLUING	Ounces		Grams
Sodium nitrate ($NaNO_3$)	0.25	=	7
Potassium nitrate (KNO_3)	0.25	=	7
Mercury dichloride ($HgCl_2$)	0.50	=	14
Potassium chlorate ($KClO_3$)	0.50	=	14
Distilled water	10.00	=	283
*Sweet spirits of niter	0.50	=	14

*Sweet spirits of niter is a solution of 3.5 to 4.5 percent of ethyl nitrite (C_2H_5ONO) in ethanol.

PHOSPHATIZING

This process is fast and easy and much less dangerous than the hot-salt bluing process.

The parts are cleaned and eventually sandblasted to provide them with a dull nonreflecting finish.

Once this is done, the parts should be thoroughly degreased.

The phosphatizing solution is heated to the boiling point and kept at a gentle boil. The parts are immersed for about 30 minutes (or more) to obtain the desired color. Place the parts in boiling water to clean them.

Remove, dry, and coat the parts with a good gun oil or rust-inhibiting oil.

Use a commercially available solution (and work according to the directions, which may be slightly different than the description given above). In the United States the phosphatizing process was developed and sold by the Parker Rust-Proof Company of Cleveland, Ohio, hence the name Parkerizing.

If you can't purchase a ready-to-use solution, you can make a very usable substitute with the following recipe, based on French patent # 698878:

Recipe for Phosphatizing

1. Pour 200 milliliters of 85-percent phosphoric acid (H_3PO_4) in 300 milliliters distilled water.
2. Heat the solution and add as much manganese carbonate ($MnCO_3$) as it will dissolve.
3. Mix 30 milliliters of this solution with 1 liter of distilled water to obtain the final phosphatizing solution.
4. Phosphatizing is done by boiling the parts in this solution until the desired color is obtained (usually 30 to 60 minutes). Maintain the proper concentration by adding water to compensate for evaporation.

CONVERSION FROM METRIC TO U.S. MEASUREMENT SYSTEM

GENERAL DIMENSIONS

Use a spreadsheet home computer program or a pocket calculator to do the following:

- Convert millimeters to inches by multiplying by 0.03937
- Convert grams to ounces by dividing by 28.35

TUBING

For the receiver, the nearest U.S. dimension is a 1 1/2-inch exterior diameter, with 1/12-inch wall thickness; in this case you must adapt the drawings slightly for the following parts:

- Bolt carrier
- Bolt front ring
- Front and back support rings
- Rear barrel support
- Front and back plugs

THREADING

The following table of conversion may be used:

Metric	U.S.
M38x1.5	UNEF 1 1/2–18
M3	UNC 5–40
M4	UNC 8–32
M5	UNC 10–24

DRAWINGS

ADVICE

These drawings were made to be used as separate full-scale units in several workshops. Before using them pay attention to the following points:

1. Protection of the original:

- Don't use the original plans in the workshop because they can be easily damaged by oil or dirt. Use photocopies instead.

2. Scaling:

- The drawings presented vertically (for example #003) are already full scale and don't need any adaptation.
- The drawings presented horizontally (those denoted by an * above the scale box, for example #001) *should be photocopied at 150 percent to obtain a full-scale plan.*
- Measure some element of the first copy and compare it with the dimensions given on the drawing to check that the copier is correctly set. If necessary modify the enlargement factor.

3. Warning:

- Any other use of the copies would be in violation of the copyright regulations.

LIST OF DRAWINGS

Gun's assembly groups:

1.	Receiver with barrel and main spring	Total:	22 pieces
2.	Bolt	Total:	17 pieces
3.	Trigger mechanism housing	Total:	16 pieces
4.	Trigger mechanism	Total:	21 pieces
5.	Pistol grip	Total:	8 pieces
6.	Sights	Total:	18 pieces
7.	Folding stock	Total:	21 pieces
8.	Handguard and front grip		

Tools
Expedient Solutions
Silencers

GROUP 1: RECEIVER WITH BARREL AND MAIN SPRING

Code	Designation	Quantity	Drawing #
R1	Receiver		001, 002
R2	Rear plug		003
R3	Front plug		003
R4	Support ring	2 pieces	004, 005
R5	Support ring positioning stud	2 pieces	006
R6	Positioning stud spring	2 pieces	006
R7	Positioning stud retaining pin	2 pieces	006
R8	Ejector base		007
R9	Ejector		007
R10	Ejector base blocking screw		007
R11	Main spring guide		008
R12	Main spring guide end pieces	2 pieces	008
R13	Main spring		008
R14	Barrel		009
R15	Rear barrel support with feeding ramp		010
R16	Rear barrel support screws	2 pieces	

GROUP 2: BOLT

Code	Designation	Quantity	Drawing #
B1	Bolt carrier		011–014
B2	Bolt carrier front ring		015
B3	Bolt carrier front ring screws	3 pieces	
B4	Bolt pins	2 pieces	016
B5	Bolt		017
B6	Extractor pin		018
B7	Extractor		018
B8	Extractor spring		018
B9	Firing pin		018
B10	Firing pin blocking screw		018
B11	Cocking handle		019
B12	Cocking handle positioning stud		019
B13	Positioning stud spring		019
B14	Positioning stud retaining screw		019

GROUP 3: TRIGGER MECHANISM HOUSING

Code	Designation	Quantity	Drawing #
H1	Housing		020, 021
H2	End plates	2 pieces	022
H3	Rear hook		023
H4	Rear screws	2 pieces	
H5	Front hook		023
H6	Front screws	2 pieces	
H7	Pistol grip support block		024

Code	Designation	Quantity	Drawing #
H8	Pistol grip retaining screw		
H9	Support block retaining screws	2 pieces	
H10	Trigger guard		025
H11	Bottom screw	2 pieces	

GROUP 4: TRIGGER MECHANISM

Code	Designation	Quantity	Drawing #
T1	Trigger		026
T2	Trigger arms	2 pieces	027
T3	Rivets	2 pieces	027
T4	Trigger spring		028
T5	Disconnector		028
T6	Disconnector and spring axis pin	2 pieces	027
T7	Trigger and sear axis pin	2 pieces	029
T8	Trigger and sear spacers	2 pieces	029
T9	Sear		030
T10	Plunger		028
T11	Sear spring		028
T12	Selector guide		031
T13	Selector		032
T14	Axis retaining spring		029
T15	Sear positioning screw		029
T16	M3 self-locking nut		

GROUP 5: PISTOL GRIP

Code	Designation	Quantity	Drawing #
G1	Magazine housing		033, 034
G2	Magazine latch support		034
G3	Magazine latch		035
G4	Spring guide		035
G5	Magazine latch spring		035
G6	Magazine latch axis (also grip screw)		
G7	M3 self-locking nut		
G8	Pistol grip shell		036

GROUP 6: SIGHTS

Code	Designation	Quantity	Drawing #
S1	Collars	2 pieces	037
S2	Bases	2 pieces	037
S3	Blind rivets	8 pieces	
S4	Rear sight		038
S5	Sights screws	2 pieces	038
S6	M3 self-locking nut		
S7	Front sight support		039
S8	Front sight		039

GROUP 7: FOLDING STOCK

Code	Designation	Quantity	Drawing #
F1	Butt stock		040
F2	Butt stock front plug		041
F3	Butt stock front plug screw		
F4	Butt stock locking spring		041
F5	Spring rest		041
F6	Sliding guide		042
F7	Hinge		042
F8	Hinge screw		
F9	Butt stock retaining screw		
F10	M4 self-locking nut	4 pieces	
F11	Locking tube		043
F12	Folding stock support		043
F13	Axis pin		
F14	Folding stock assembly retaining screws	2 pieces	
F15	Washer		
F16	Front locking stud		041
F17	M3 self-locking nut		

GROUP 8: HANDGUARD AND FRONT GRIP

Code	Designation	Quantity	Drawing #
W1	Handguard		044
W2	Handguard screw		
W3	Front grip		045
W4	Front grip screw		

Tools

Code	Designation	Quantity	Drawing #
Tool 1	Template to drill the holes in parts R4, B1, B2		046
Tool 2	Guiding tool to drill the main pin holes		047
Tool 3	Device to chuck the bolt carrier on a lathe		048
Tool 4	Device to form the sight collars		049
Dummy round 9mm Parabellum			050
Tool 5	Magazine housing forming die		051
Trigger mechanism test fixture			052

EXPEDIENT SOLUTIONS

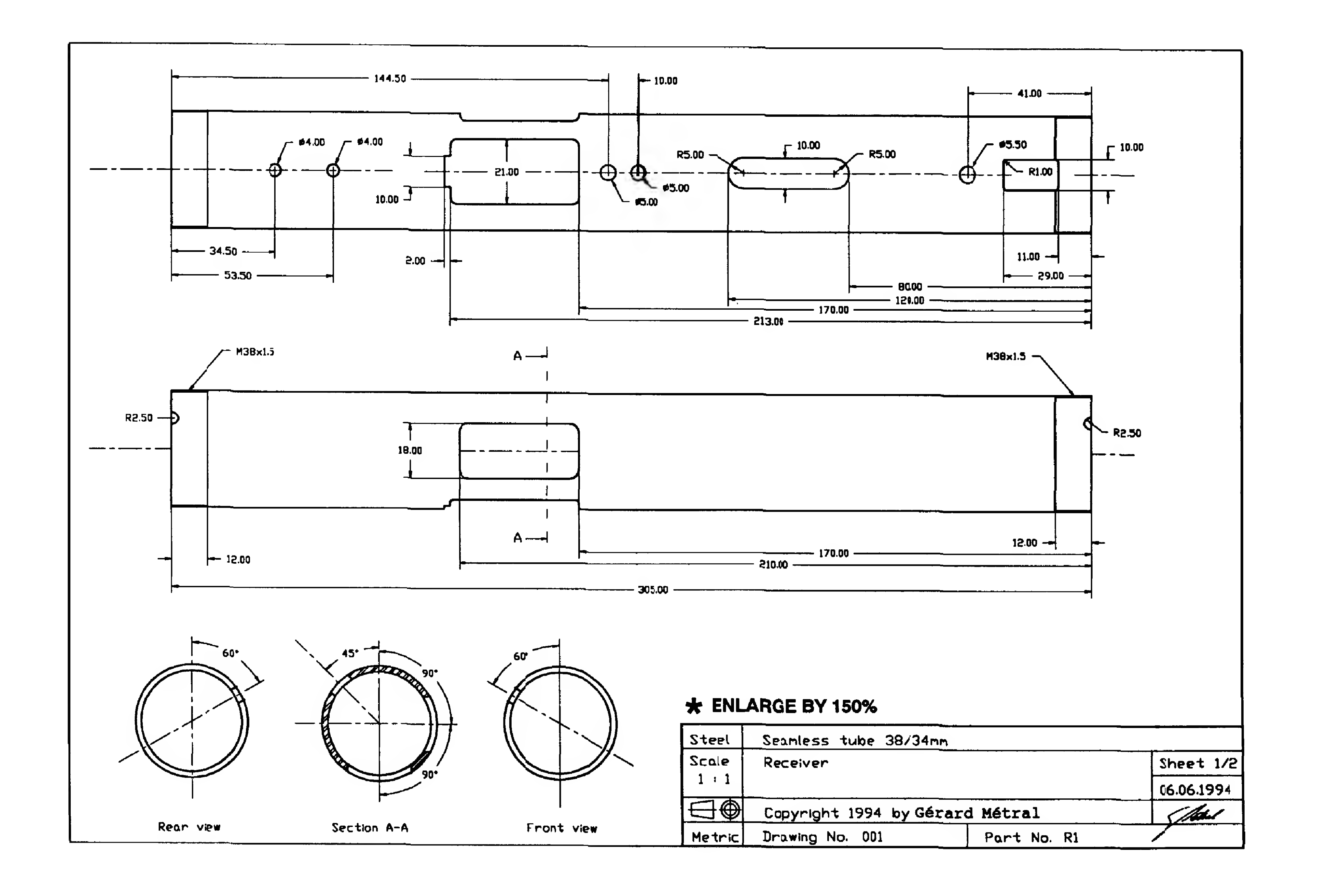
Group 1 Receiver and plugs without threading

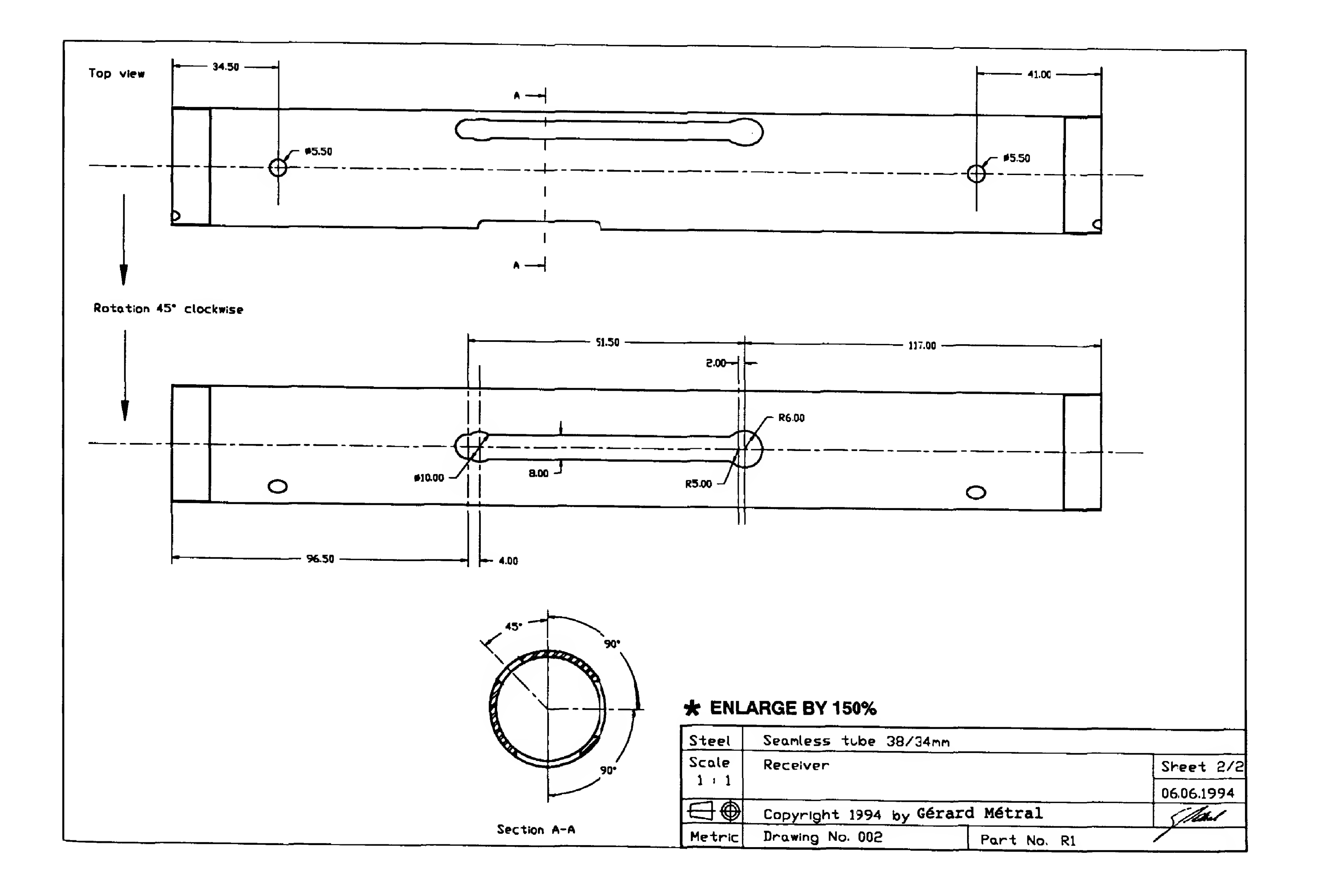
Code	Designation	Quantity	Drawing #
	List of parts		053
R1E	Receiver		054, 055
R2E	Rear plug		056
R3E	Front plug		056
R4E	Support ring	2 pieces	057

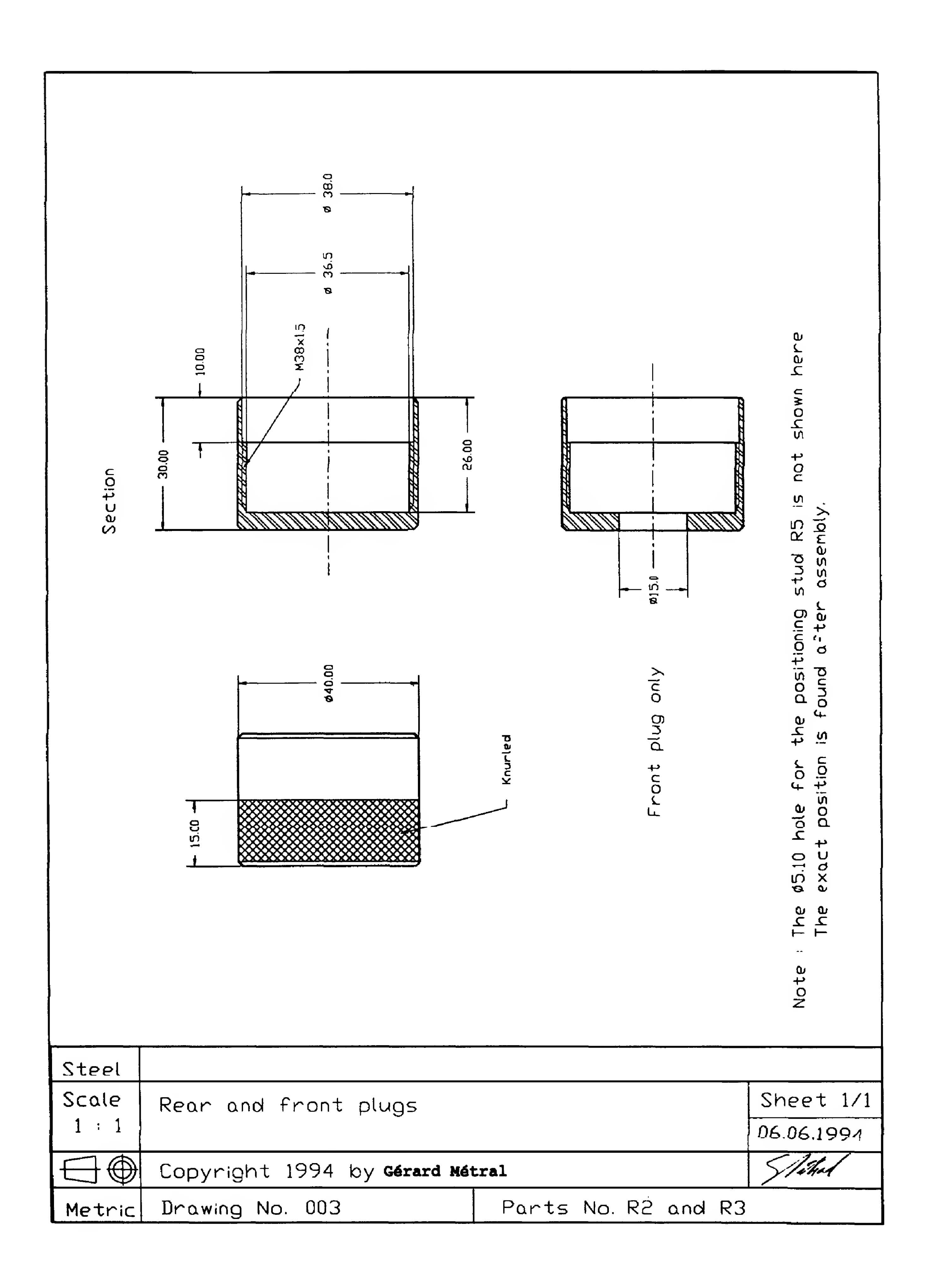
Code	Designation	Quantity	Drawing #
R4E-S	Support ring screws	5 pieces	057
R5E	Retaining stud	4 pieces	057
R6E	Retaining stud spring	4 pieces	057
R7E	Inner ring	2 pieces	057
R8E	Ejector base		058
R9E	Ejector		058
Group 2	***Bolt carrier, 3 part-version, ensemble view***		059
B1E-1	Bolt carrier module 1		059, 062
B1E-2	Bolt carrier module 2		059, 060, 061, 062
B1E-3	Bolt carrier module 3		059, 061, 062
Bolt, solution without use of a milling machine			
B5E	Bolt		063
Welded bracket solution to assemble the trigger housing to the receiver, ensemble view			*064*
H5E-1	Bracket		064
H5E-2	Retaining pin		064
H5E-3	Retaining pin spring		064
Rifling head			*065*

SILENCER

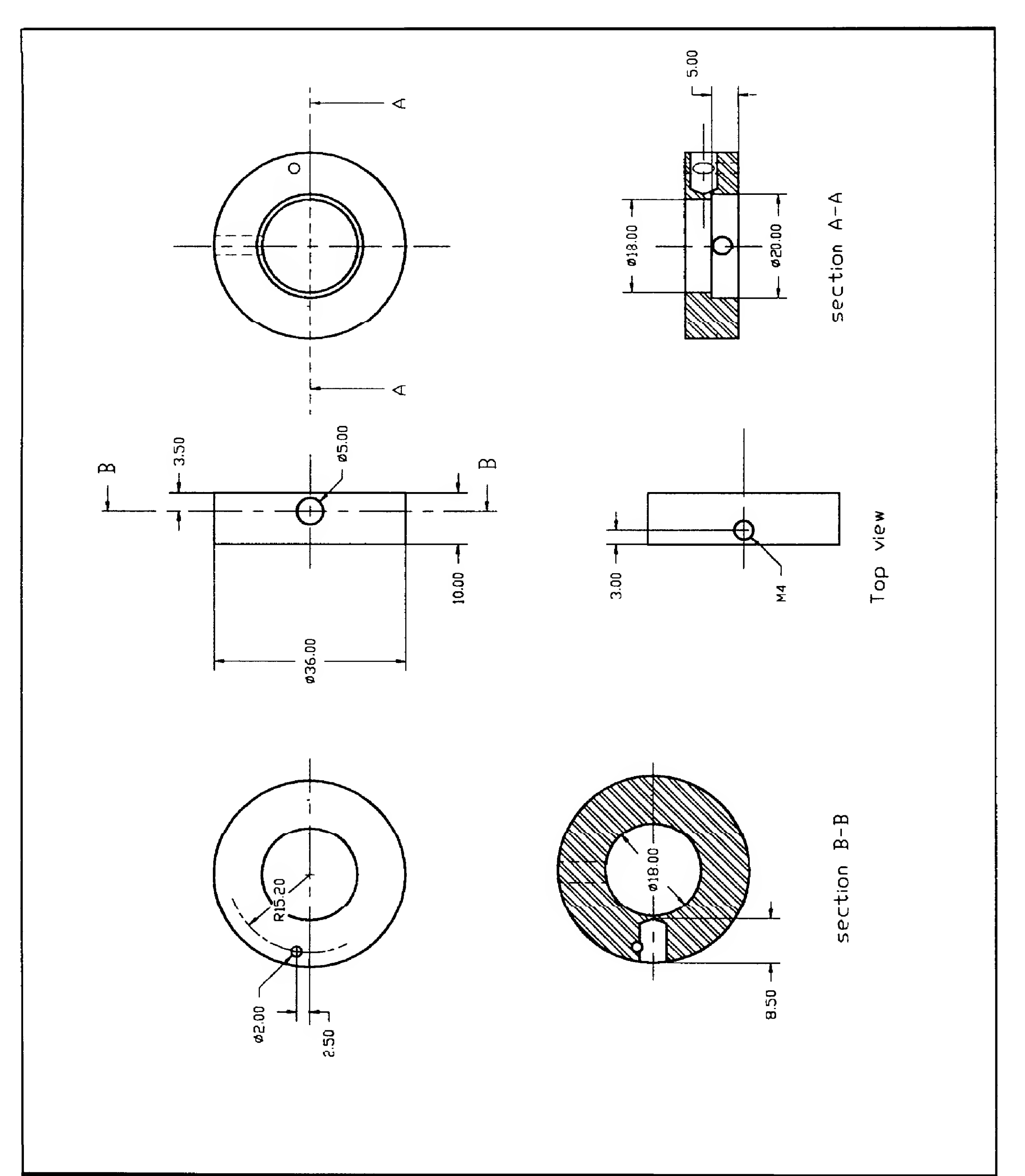
Designation	Drawing #
Silencer version 1, with rubber baffles, ensemble view	066
Silencer version 1, parts, including fixation	067
Silencer version 2, ensemble view	068
Silencer version 2, parts, including fixation	069
Silencer version 2, inner tubes and deflector	070


144.50
10.00
41.00
ø4.00
ø4.00
21.00
10.00
ø5.00
ø5.00
R5.00
10.00
R5.00
ø5.50
R1.00
10.00
34.50
53.50
2.00
11.00
29.00
80.00
120.00
170.00
213.00
M38x1.5
A
M38x1.5
R2.50
18.00
R2.50
A
12.00
12.00
170.00
210.00
305.00
60°
45°
90°
90°
60°
Rear view
Section A-A
Front view
* ENLARGE BY 150%
Steel
Seamless tube 38/34mm
Scale
1 : 1
Receiver
Sheet 1/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 001
Part No. R1


Top view
34.50
41.00
A
A
ø5.50
ø5.50
Rotation 45° clockwise
51.50
117.00
2.00
R6.00
ø10.00
8.00
R5.00
96.50
4.00
45°
90°
90°
Section A-A
* ENLARGE BY 150%
Steel
Seamless tube 38/34mm
Scale
1 : 1
Receiver
Sheet 2/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 002
Part No. R1



Section
ø 38.0
ø 36.5
M38x1.5
10.00
30.00
26.00
ø15.0
ø40.00
15.00
Knurled
Front plug only
Note : The ø5.10 hole for the positioning stud R5 is not shown here
The exact position is found after assembly.
Steel
Scale
1 : 1
Rear and front plugs
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 003
Parts No. R2 and R3



Steel

Scale 1 : 1

Front and rear support rings

Construction step 1

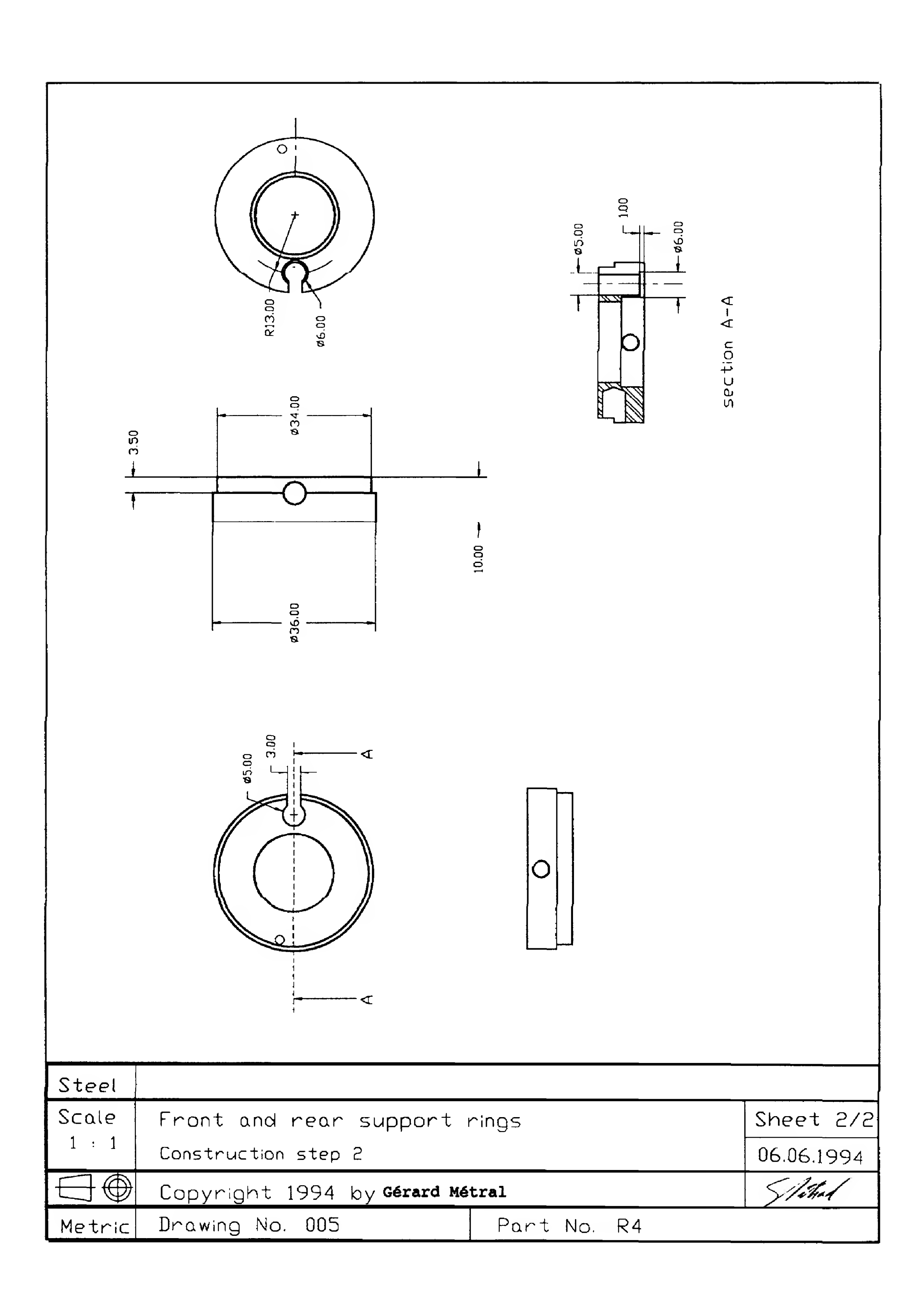
Sheet 1/2

06.06.1994

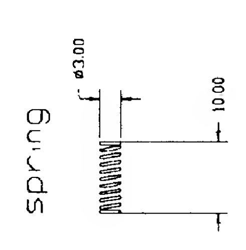
Metric

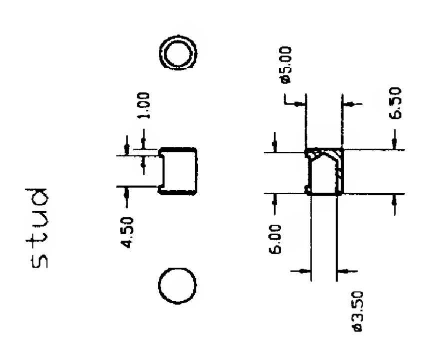
Drawing No. 004

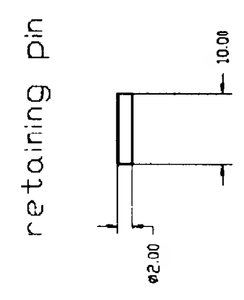
Part No. R4



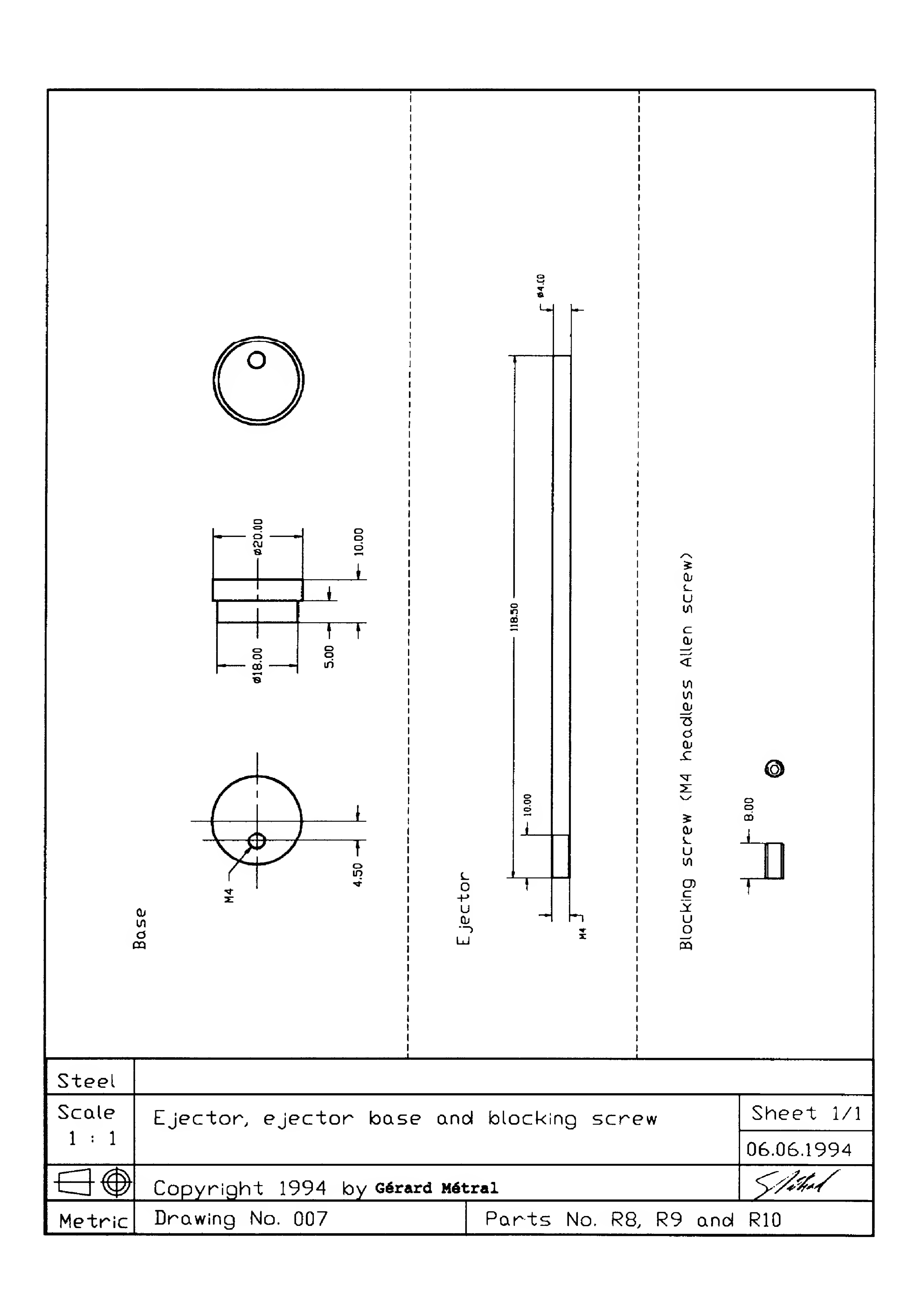
R13.00
ø6.00
ø34.00
3.50
10.00
ø36.00
ø5.00
3.00
A
A
1.00
ø5.00
ø6.00
section A-A
Steel
Scale
1 : 1
Front and rear support rings
Construction step 2
Sheet 2/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 005
Part No. R4



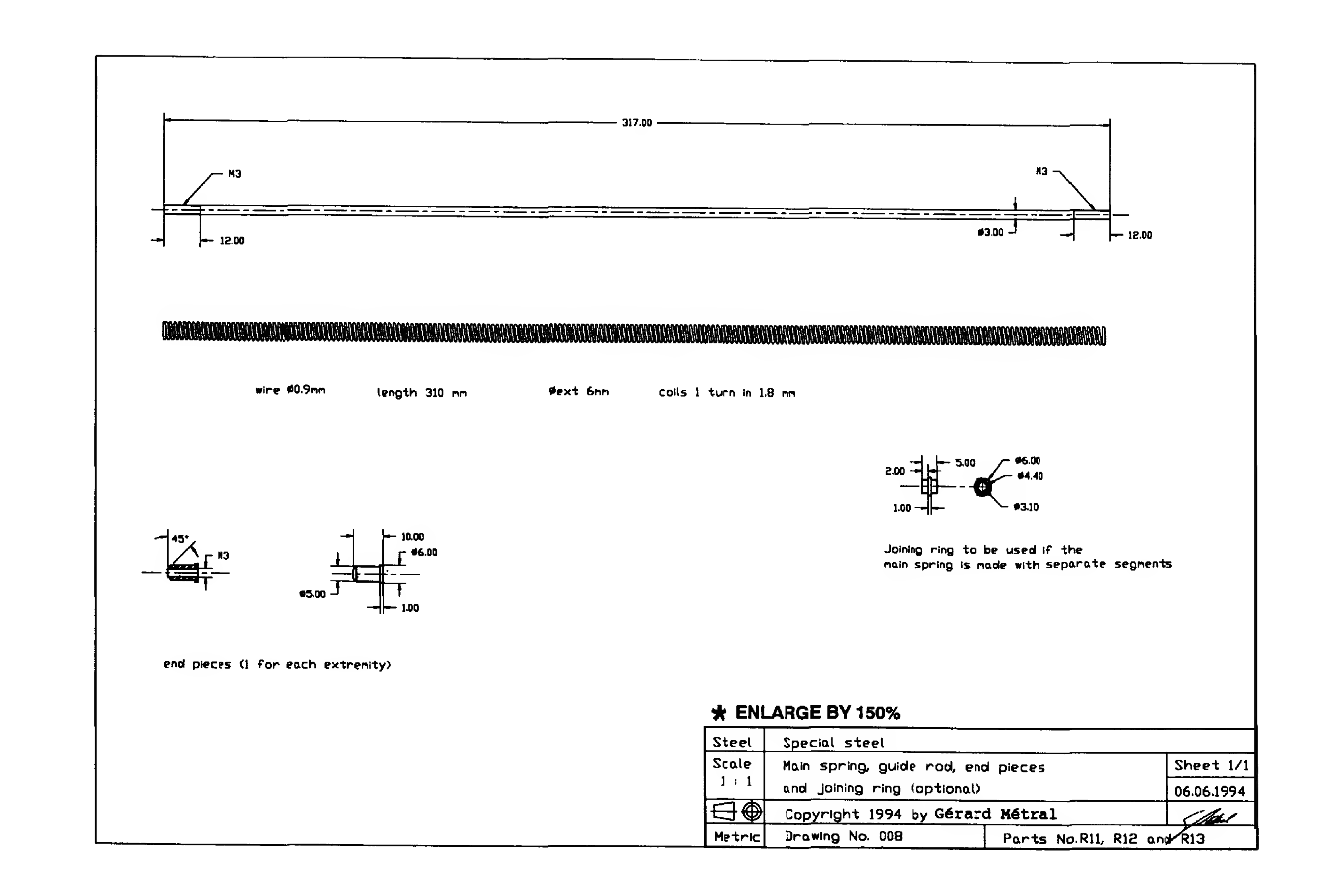


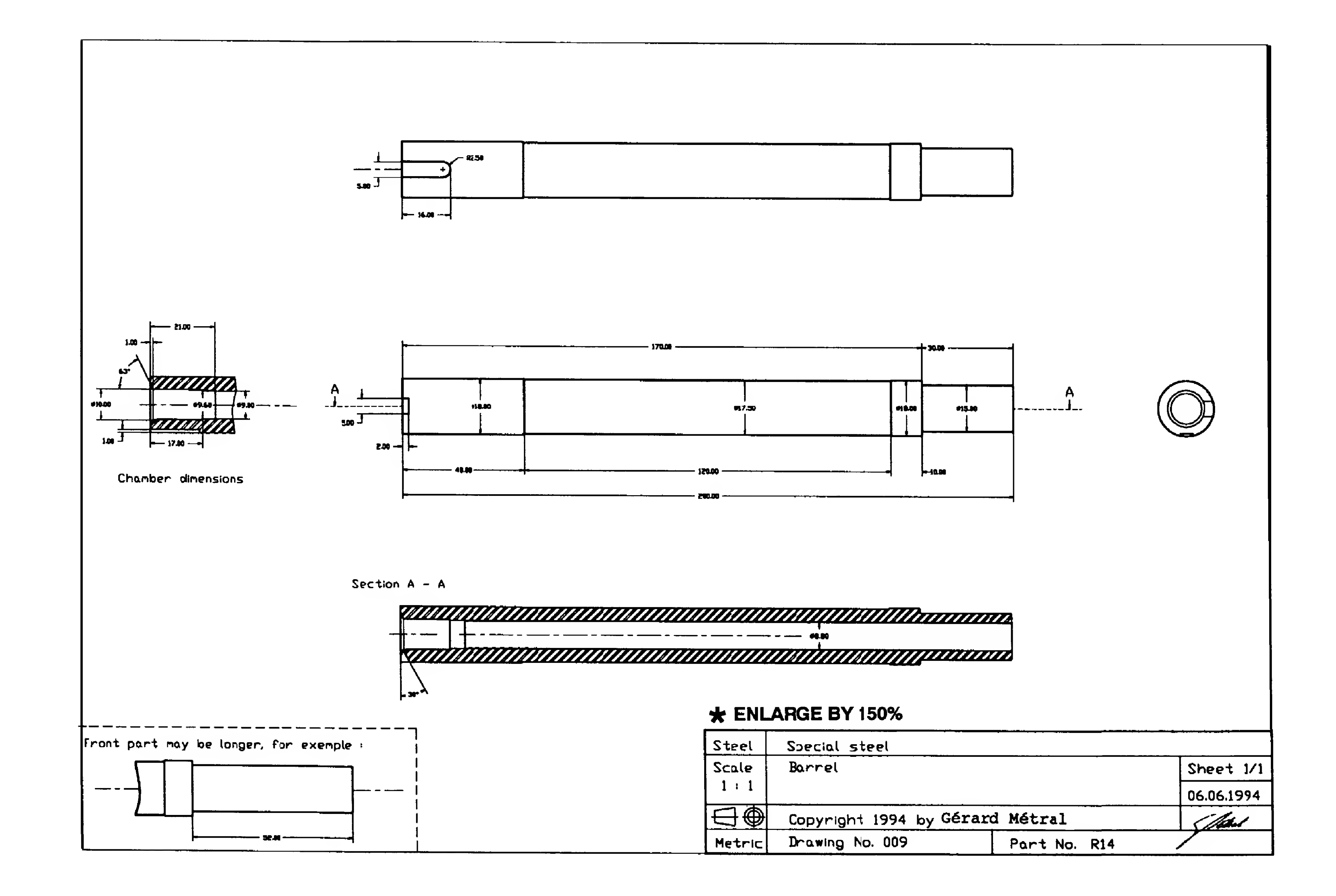


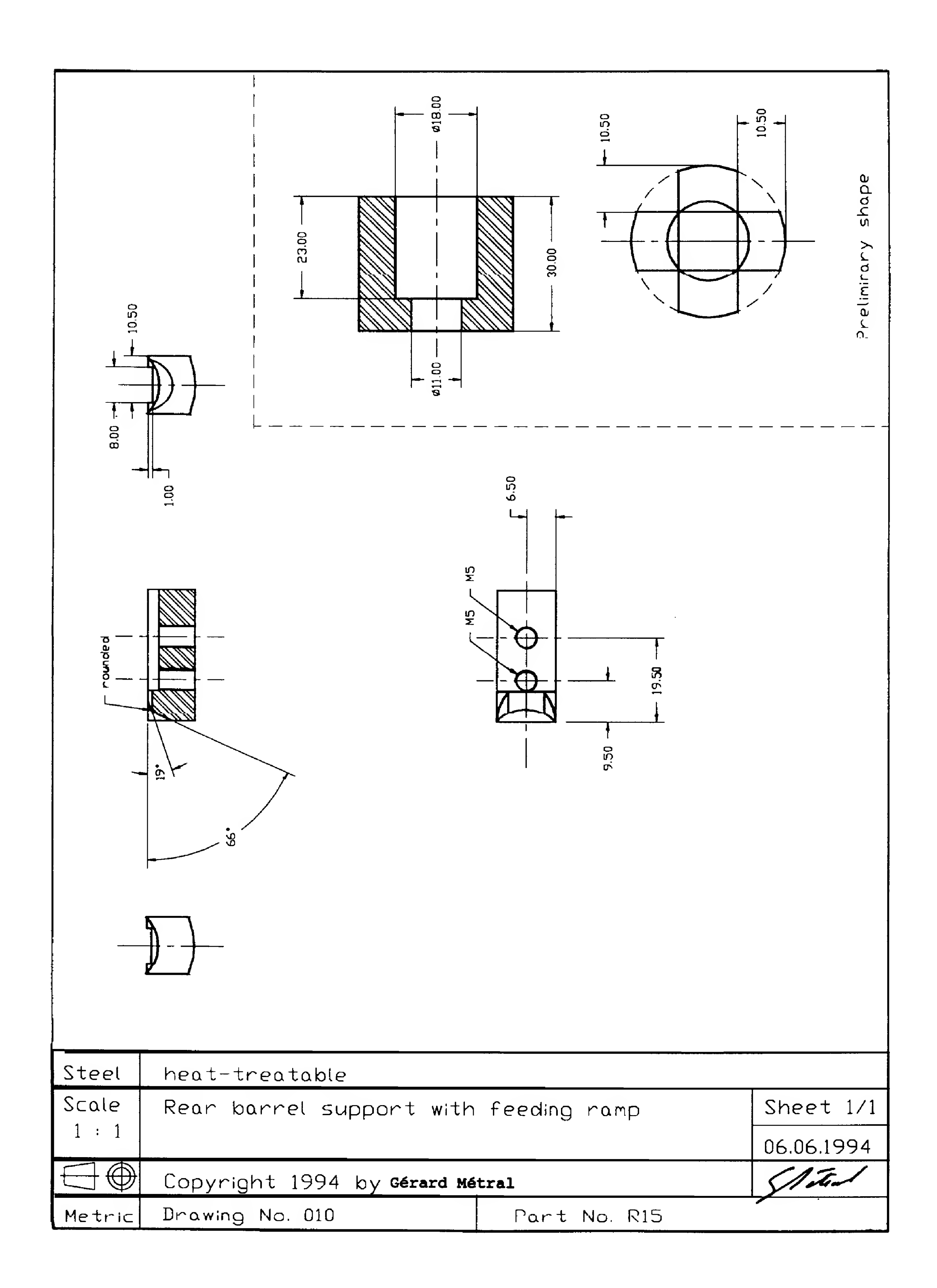
Steel		
Scale 1 : 1	Front and rear ring positioning stud with retaining pin and spring	Sheet 1/1 06.06.1994
Metric	Drawing No. 006	Parts No. R5, R6 and R7

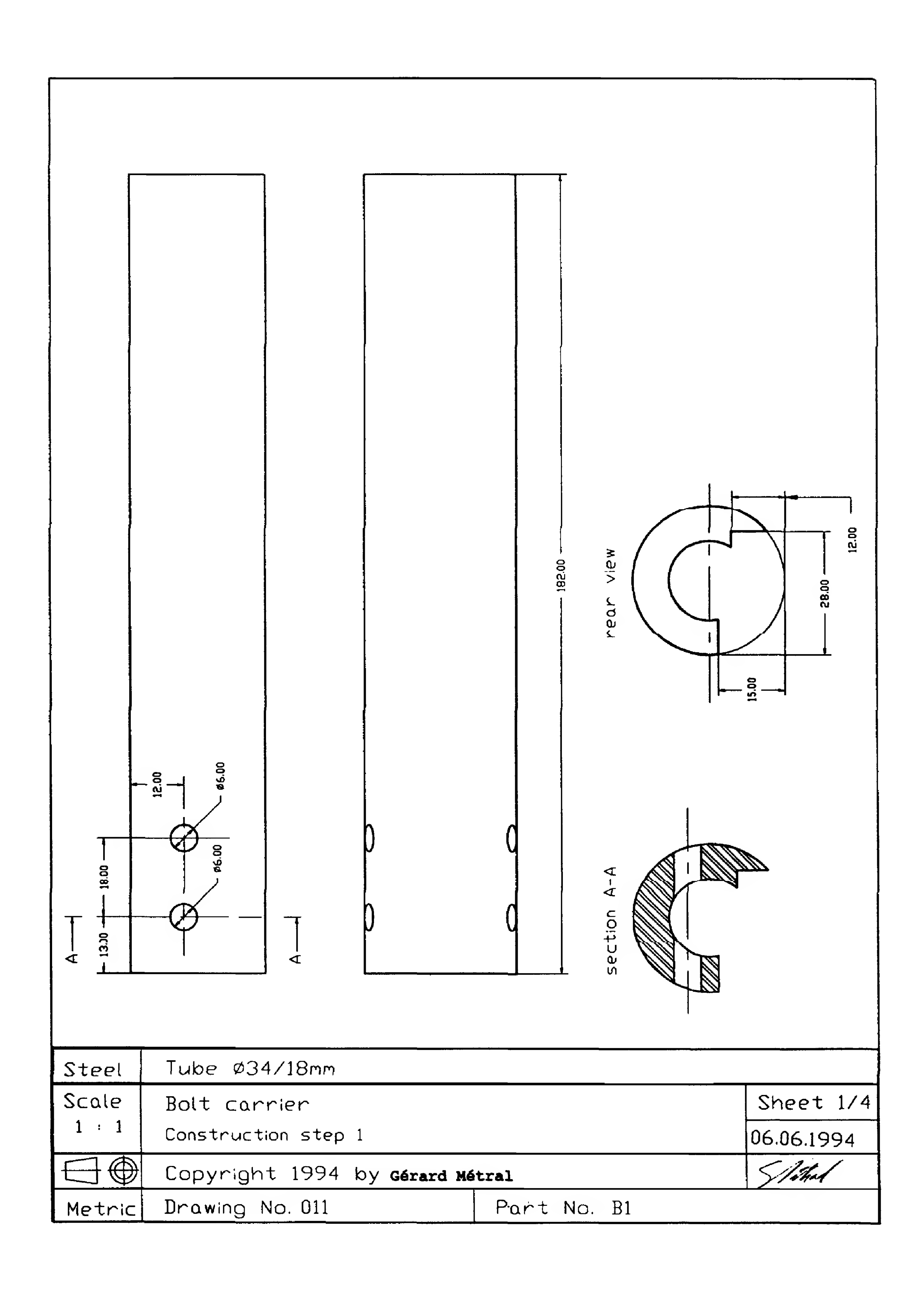


Base
M4
4.50
ø18.00
5.00
ø20.00
10.00
Ejector
M4
10.00
118.50
ø4.00
Blocking screw (M4 headless Allen screw)
8.00
Steel
Scale
1 : 1
Ejector, ejector base and blocking screw
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 007
Parts No. R8, R9 and R10

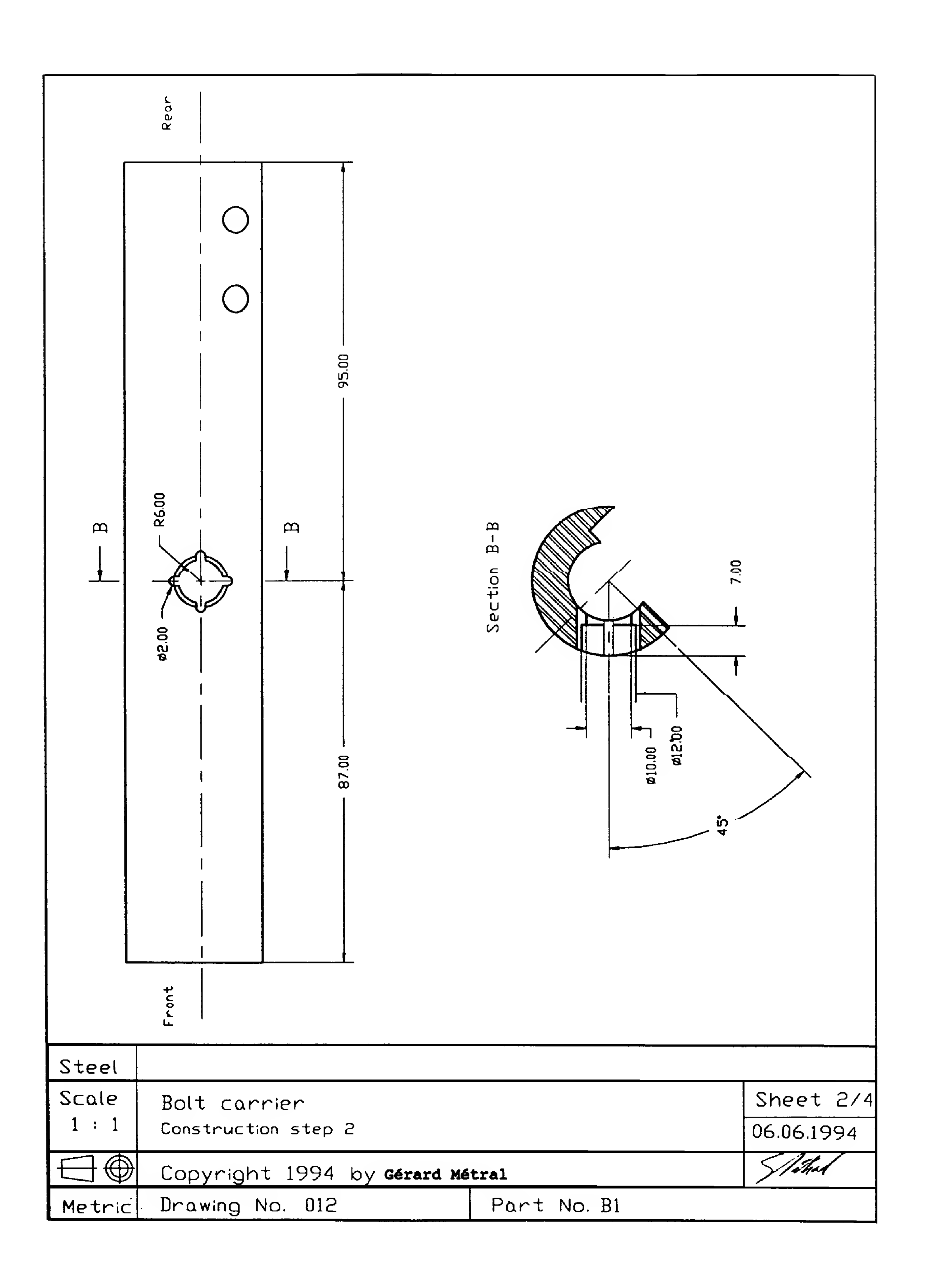

317.00
M3
M3
12.00
ø3.00
12.00
wire ø0.9mm
length 310 mm
øext 6mm
coils 1 turn in 1.8 mm
5.00
2.00
1.00
ø6.00
ø4.40
ø3.10
Joining ring to be used if the
main spring is made with separate segments
45°
M3
10.00
ø6.00
ø5.00
1.00
end pieces (1 for each extremity)
★ ENLARGE BY 150%
Steel
Special steel
Scale
1 : 1
Main spring, guide rod, end pieces
and joining ring (optional)
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 008
Parts No.R11, R12 and R13

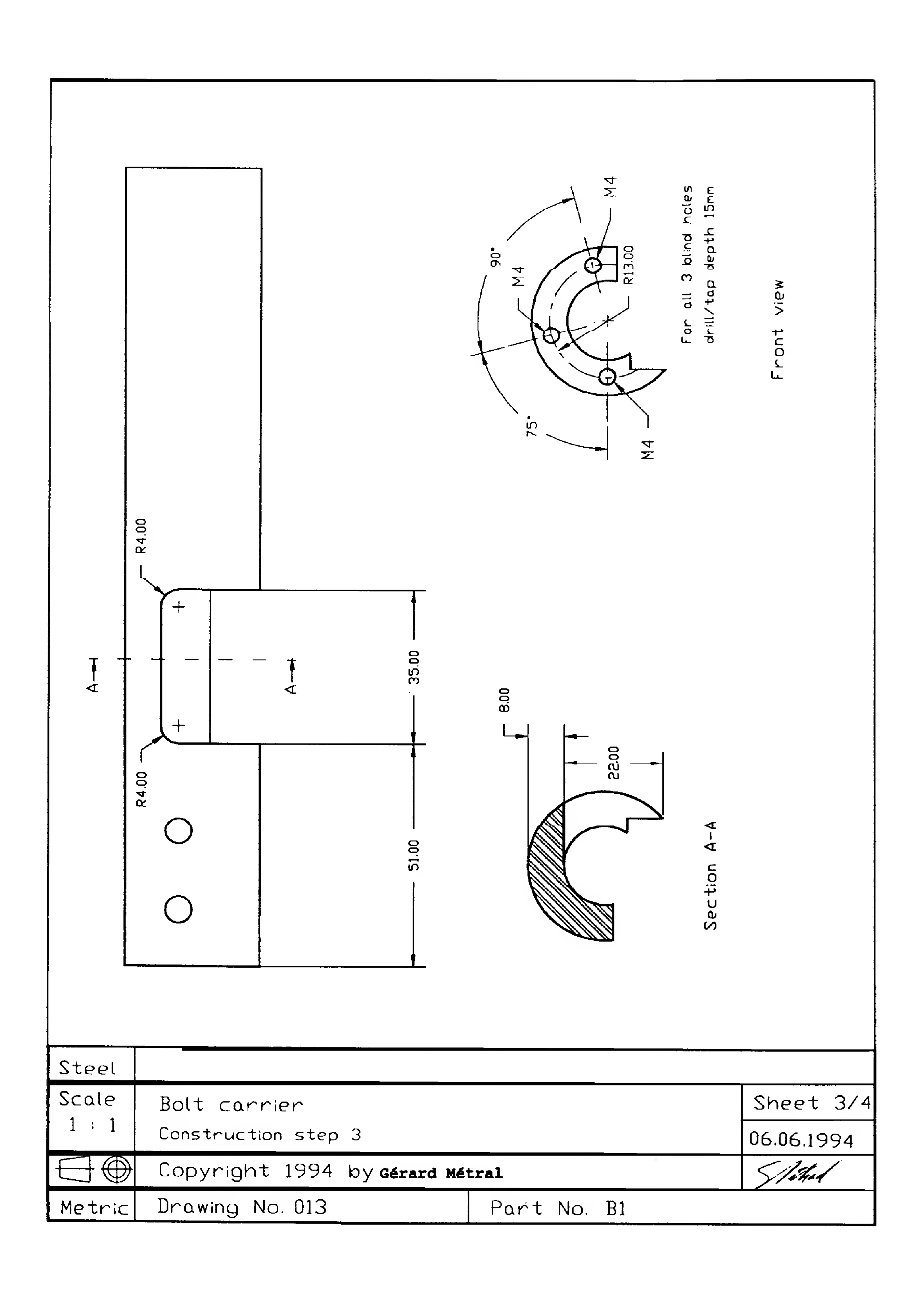

Chamber dimensions
A
A
Section A - A
* ENLARGE BY 150%
Front part may be longer, for exemple :
Steel
Special steel
Scale
1 : 1
Barrel
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 009
Part No. R14

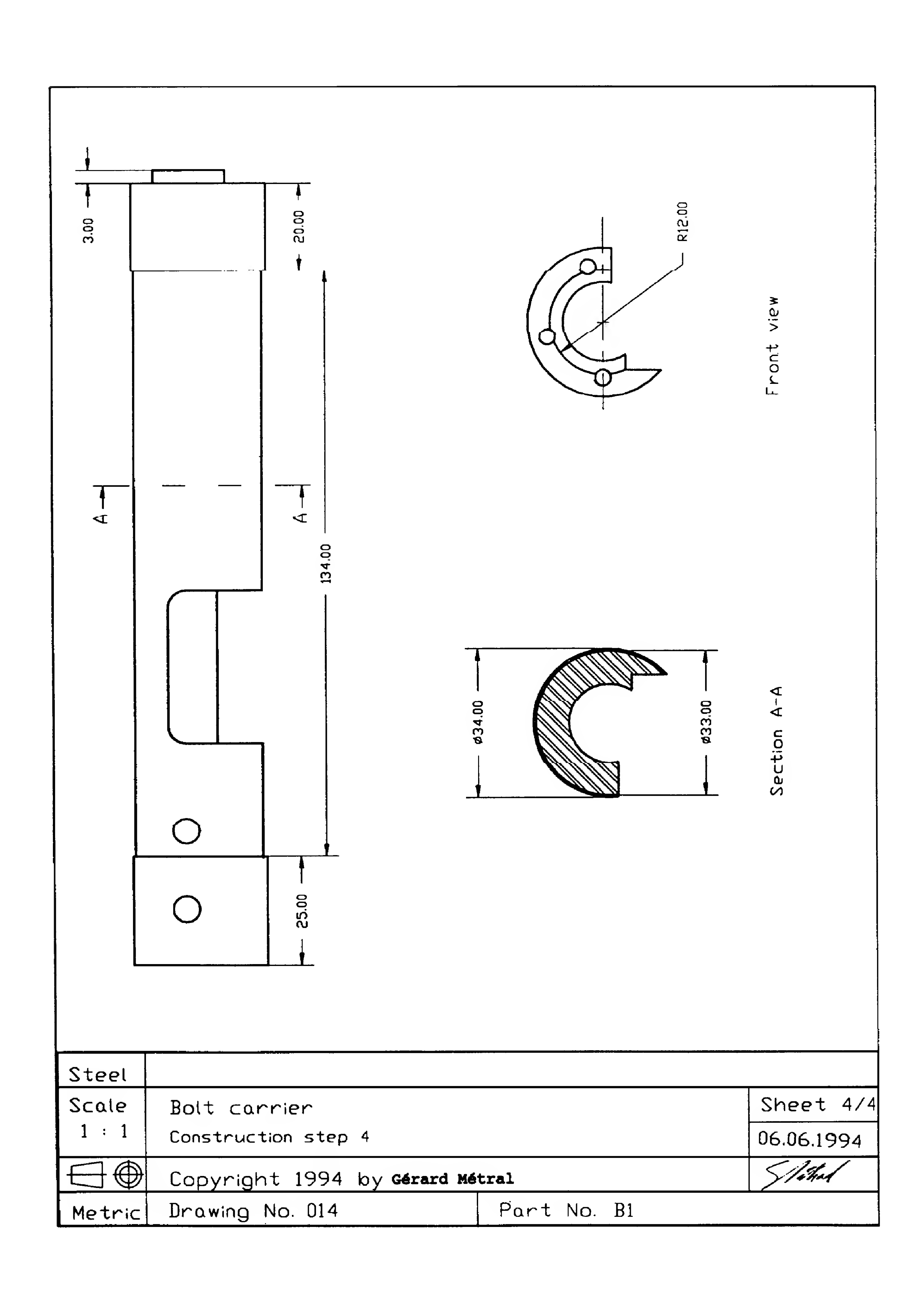

Ø18.00
23.00
30.00
Ø11.00
10.50
10.50
Prelimirary shape
10.50
8.00
1.00
rounded
19°
66°
6.50
M5
M5
19.50
9.50
Steel
heat-treatable
Scale
1 : 1
Rear barrel support with feeding ramp
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 010
Part No. R15

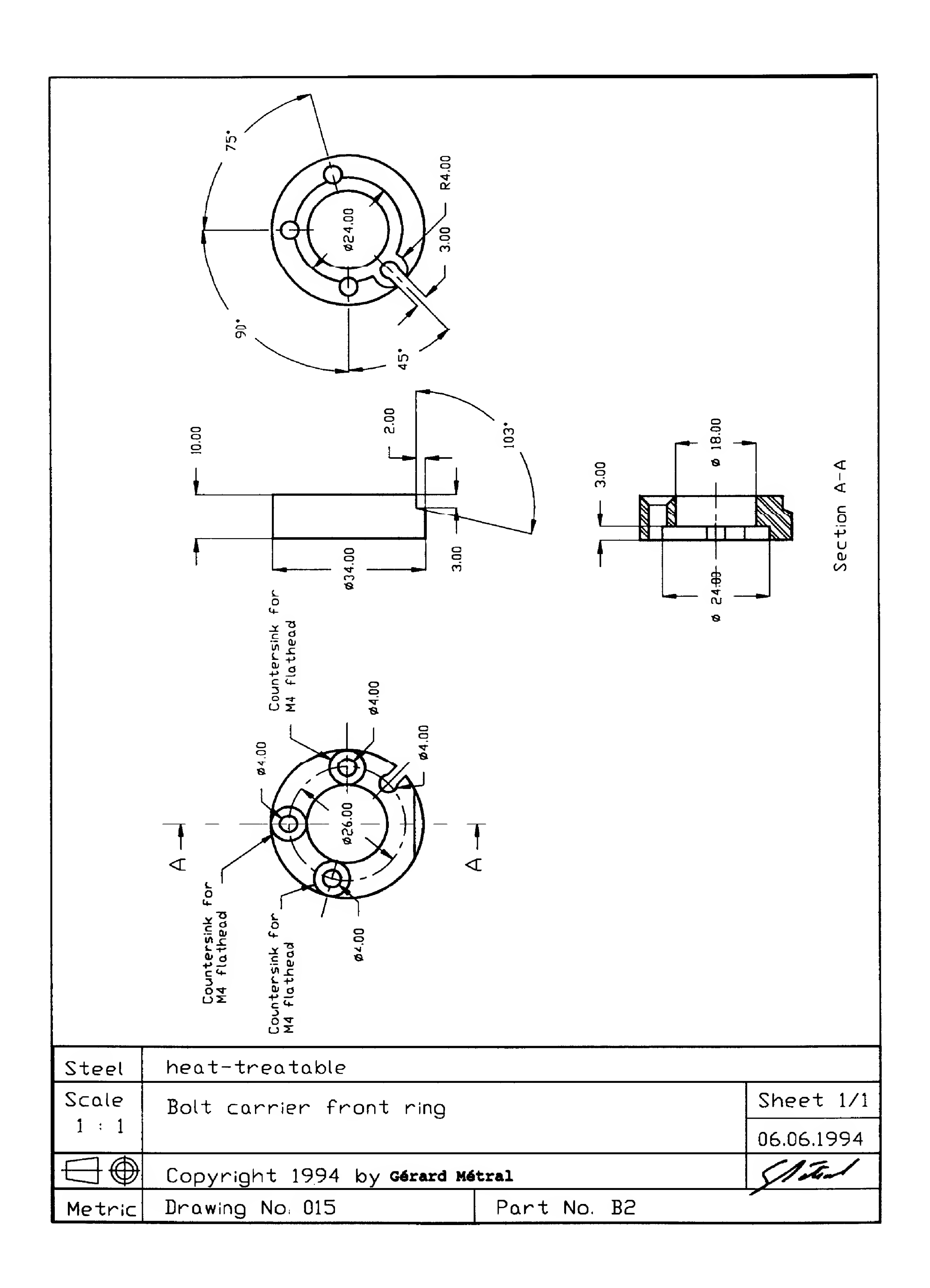


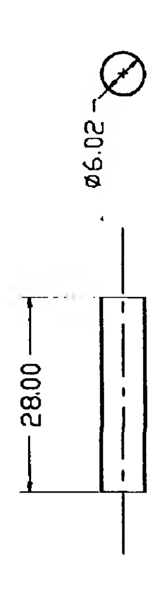
182.00
rear view
12.00
28.00
15.00
12.00
ø6.00
ø6.00
18.00
13.30
A
A
section A-A
Steel
Tube Ø34/18mm
Scale
1 : 1
Bolt carrier
Construction step 1
Sheet 1/4
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 011
Part No. B1


Rear
Front
B
B
R6.00
ø2.00
95.00
87.00
Section B-B
7.00
ø10.00
ø12.00
45°
Steel
Scale
1 : 1
Bolt carrier
Construction step 2
Sheet 2/4
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 012
Part No. B1

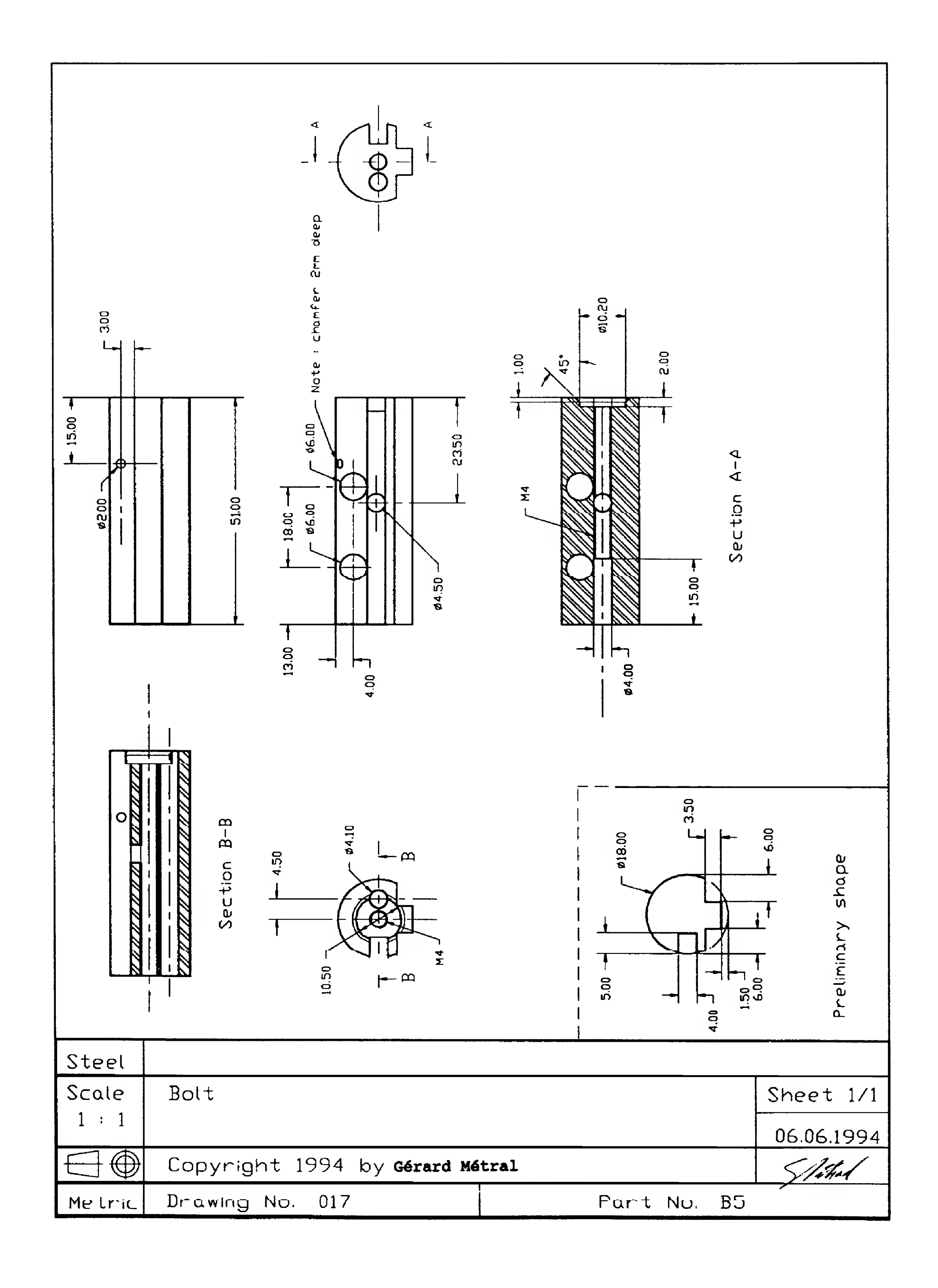

R4.00
R4.00
A
A
35.00
51.00
90°
75°
M4
M4
M4
R13.00
For all 3 blind holes
drill/tap depth 15mm
Front view
8.00
22.00
Section A-A
Steel
Scale
1 : 1
Bolt carrier
Construction step 3
Sheet 3/4
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 013
Part No. B1


3.00
20.00
R12.00
Front view
A
A
134.00
ø34.00
ø33.00
Section A-A
25.00
Steel
Scale
1 : 1
Bolt carrier
Construction step 4
Sheet 4/4
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 014
Part No. B1

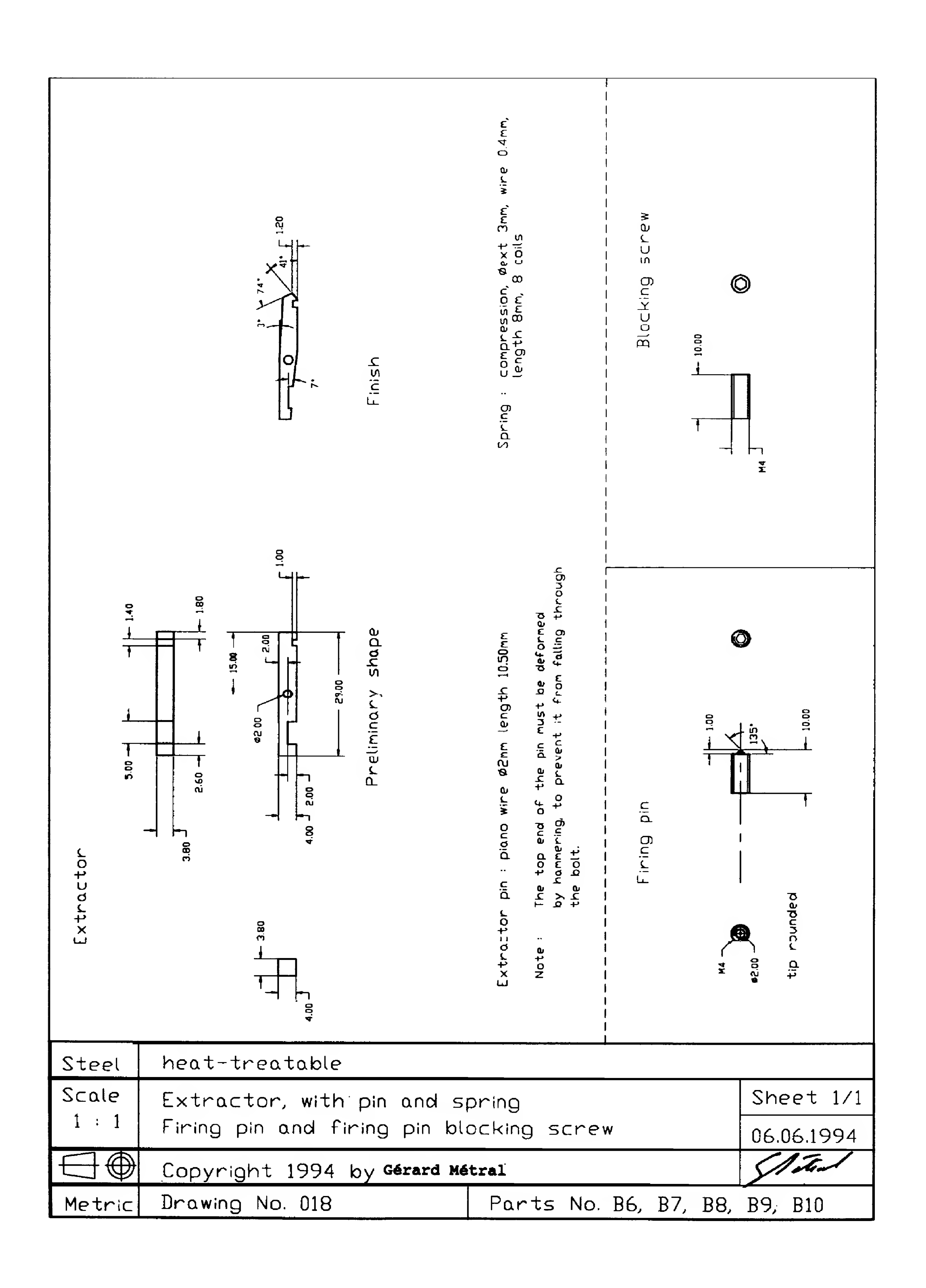

75°
R4.00
ø24.00
3.00
90°
45°
10.00
2.00
103°
3.00
ø34.00
3.00
ø 18.00
Section A-A
ø 24.00
Countersink for M4 flathead
ø4.00
ø4.00
ø4.00
ø26.00
A
A
Countersink for M4 flathead
Countersink for M4 flathead
ø4.00
Steel
heat-treatable
Scale 1 : 1
Bolt carrier front ring
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 015
Part No. B2

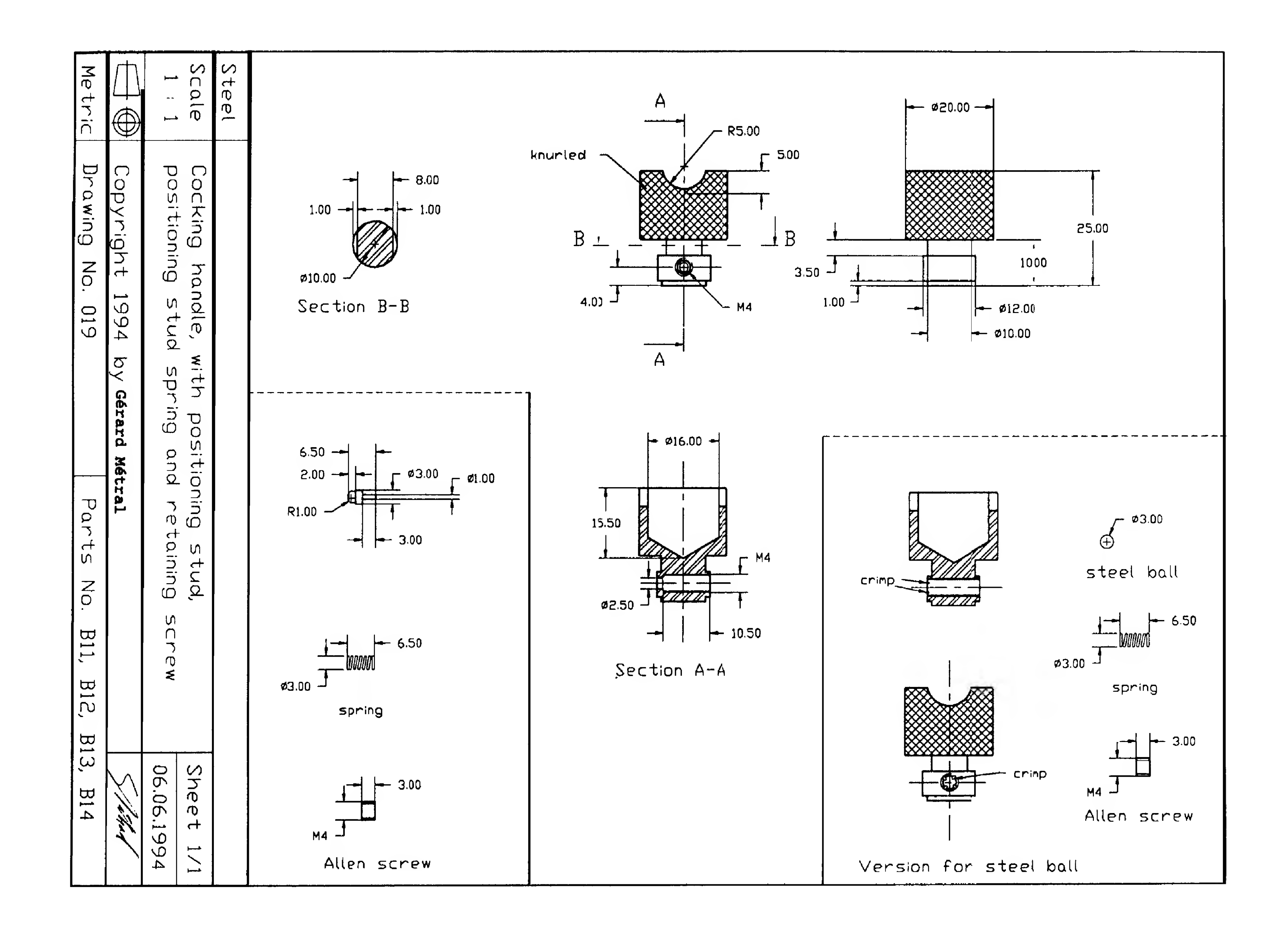


Steel	980-1180N/mm^2 DIN 34 CrNiMo 6	
Scale 1 : 1	Bolt pins	Sheet 1/1 06.06.1994
	Copyright 1994 by **Gérard Métral**	
Metric	Drawing No. 016	Part No. B4

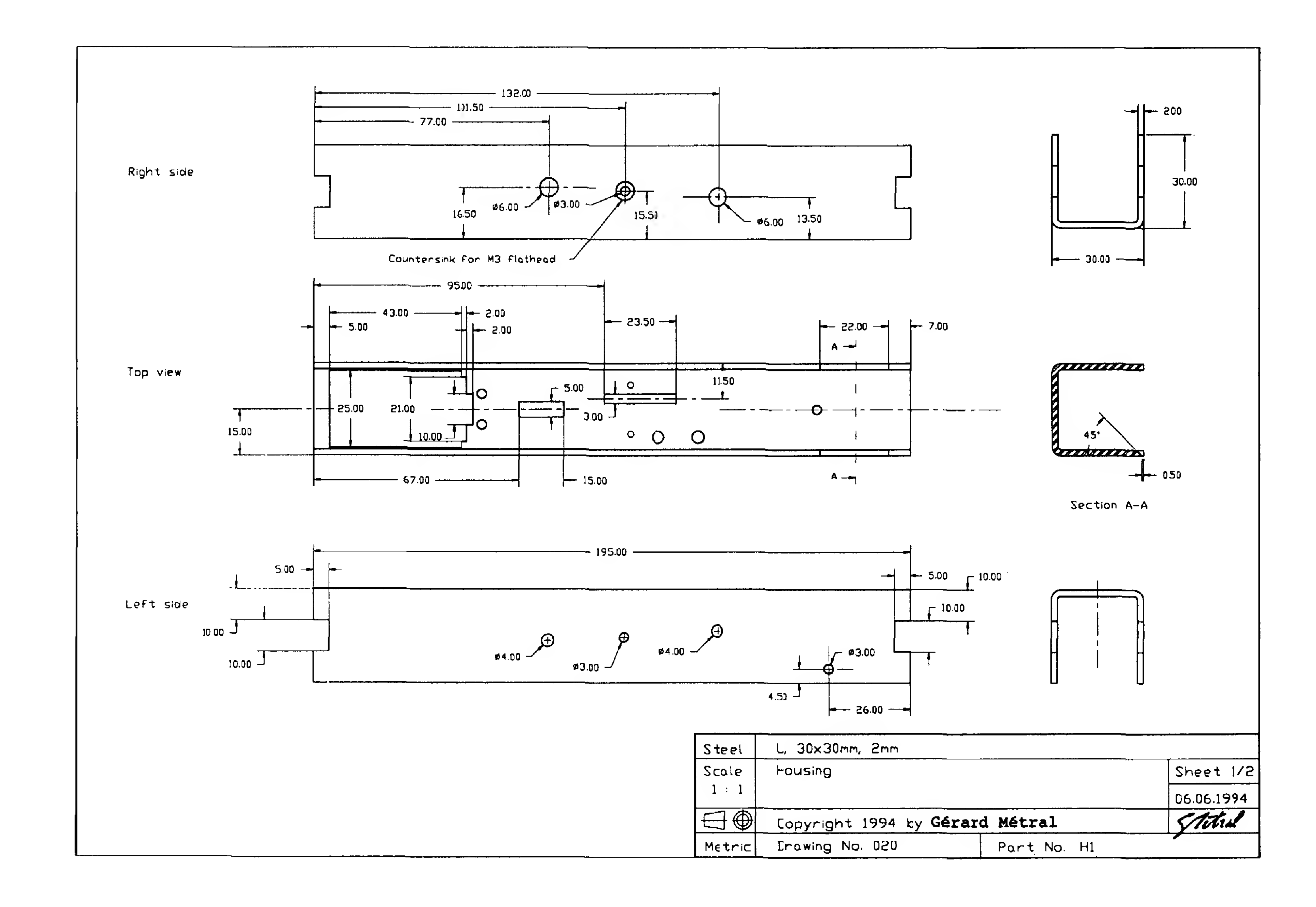


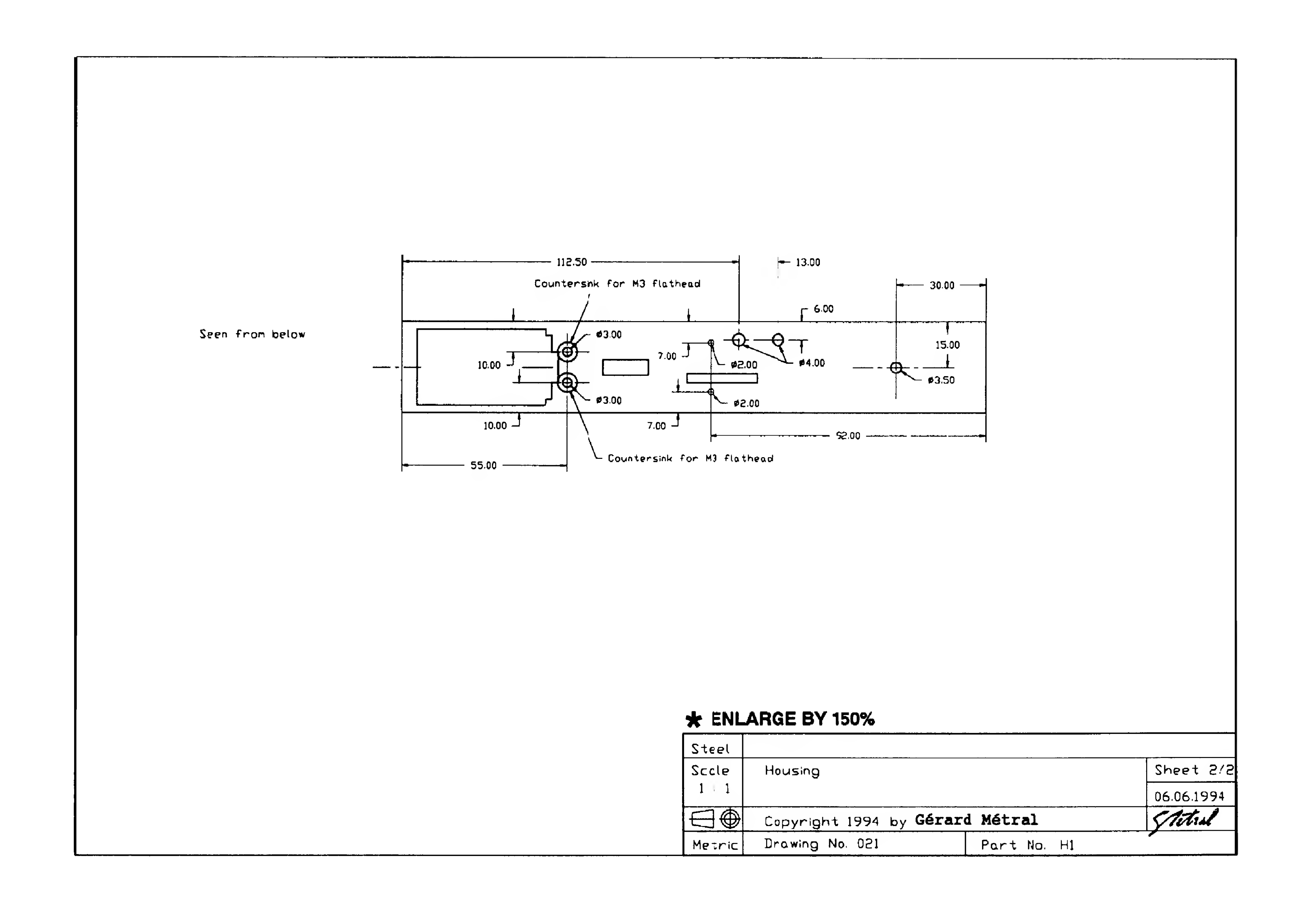
Note : chamfer 2mm deep
Section A-A
Section B-B
Preliminary shape
3.00
15.00
ø2.00
51.00
ø6.00
ø6.00
18.00
23.50
ø4.50
13.00
4.00
1.00
45°
ø10.20
2.00
M4
15.00
ø4.00
4.50
ø4.10
10.50
M4
ø18.00
3.50
6.00
5.00
4.00
1.50
6.00
Steel
Scale
1 : 1
Bolt
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 017
Part No. B5

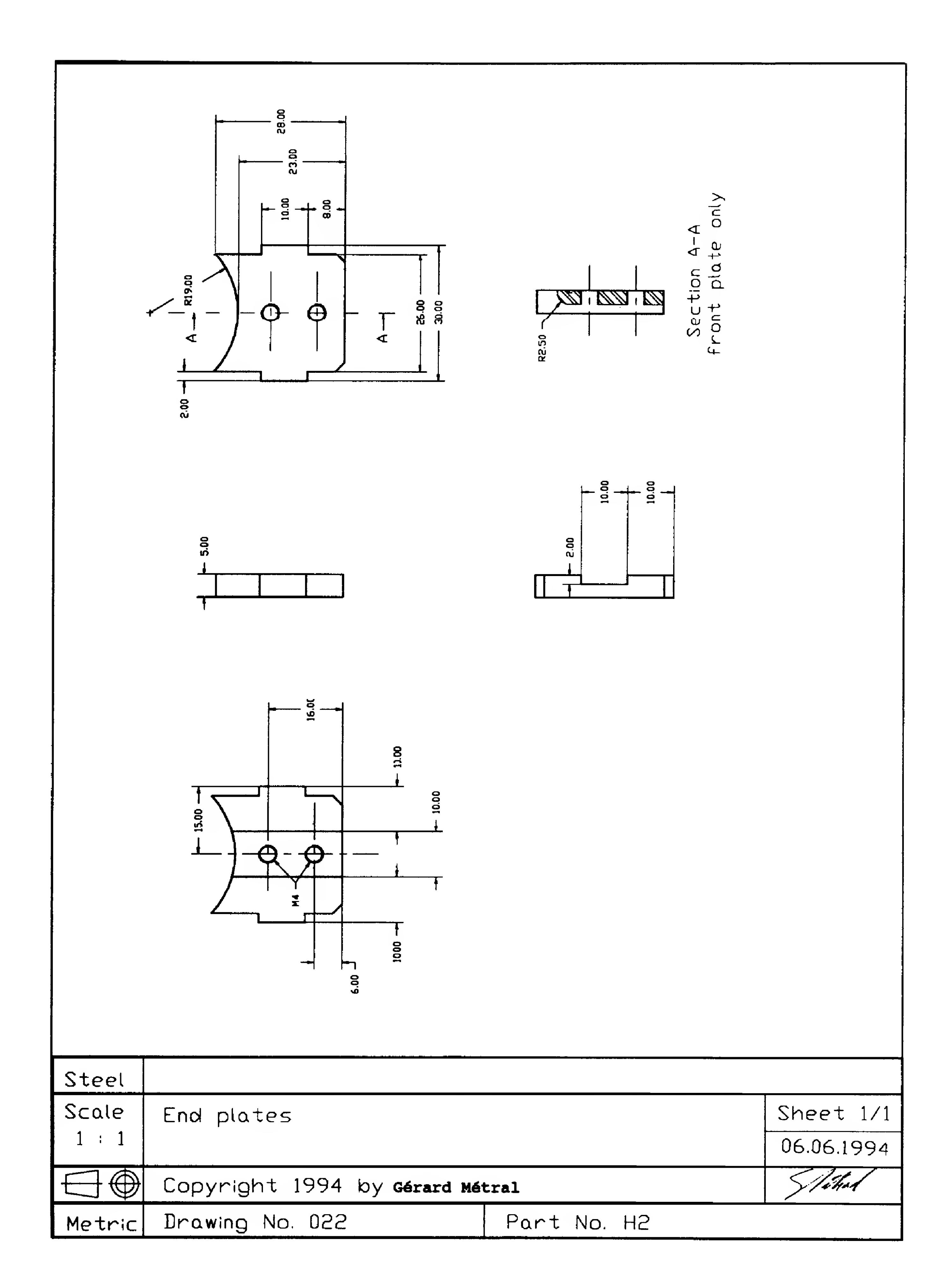

Extractor
Preliminary shape
Finish
Spring : compression, øext 3mm, wire 0.4mm, length 8mm, 8 coils
Extractor pin : piano wire ø2mm length 10.50mm
Note : The top end of the pin must be deformed by hammering, to prevent it from falling through the bolt.
Blocking screw
Firing pin
tip rounded
Steel
heat-treatable
Scale
1 : 1
Extractor, with pin and spring
Firing pin and firing pin blocking screw
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 018
Parts No. B6, B7, B8, B9, B10

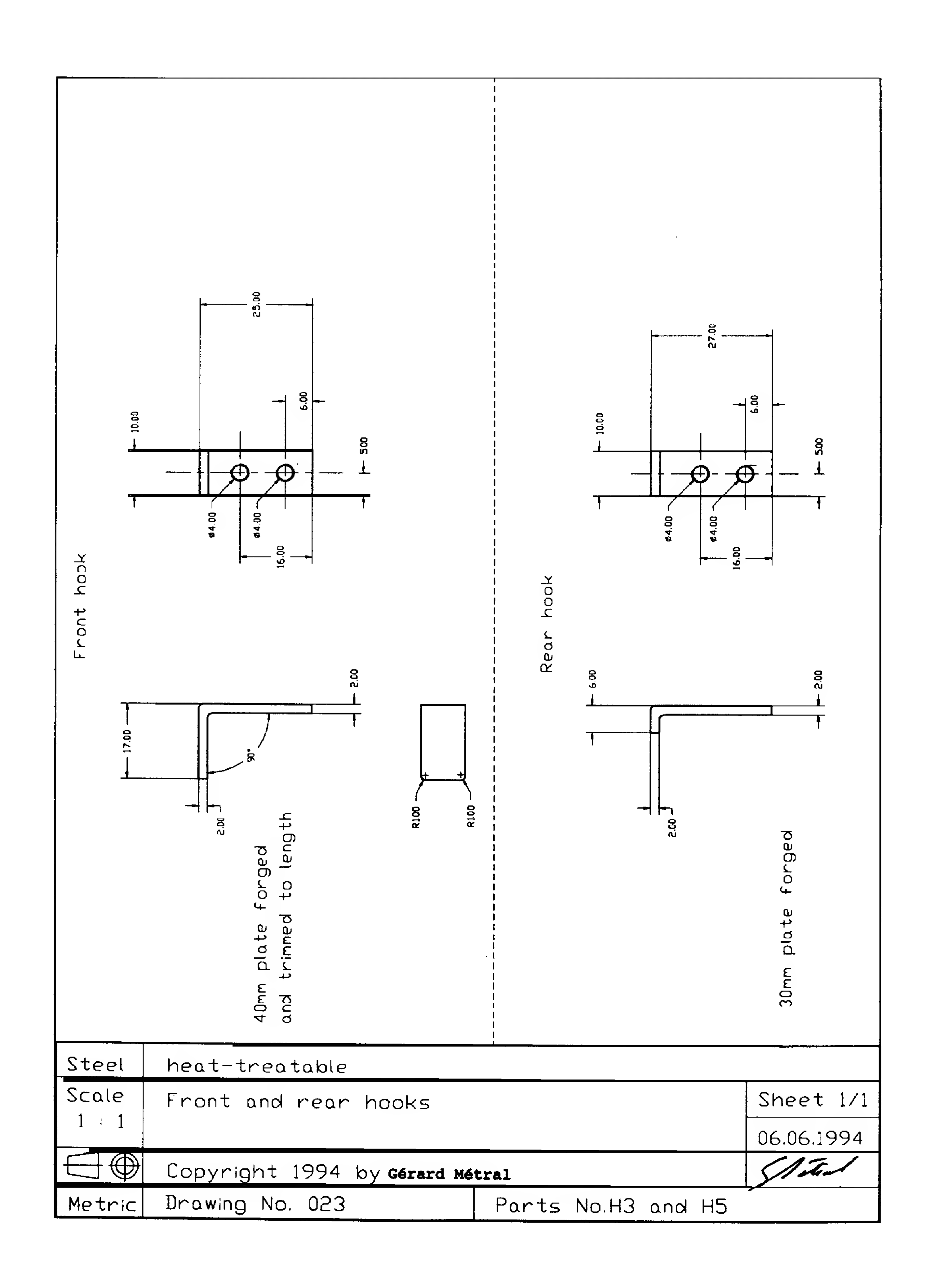


Section B-B
8.00
1.00
1.00
ø10.00
A
R5.00
knurled
5.00
B
B
4.00
M4
A
ø20.00
25.00
10.00
3.50
1.00
ø12.00
ø10.00
6.50
2.00
ø3.00
ø1.00
R1.00
3.00
6.50
ø3.00
spring
3.00
M4
Allen screw
ø16.00
15.50
M4
ø2.50
10.50
Section A-A
crimp
ø3.00
steel ball
6.50
ø3.00
spring
crimp
3.00
M4
Allen screw
Version for steel ball
Steel
Scale
1 : 1
Cocking handle, with positioning stud,
positioning stud spring and retaining screw
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 019
Parts No. B11, B12, B13, B14

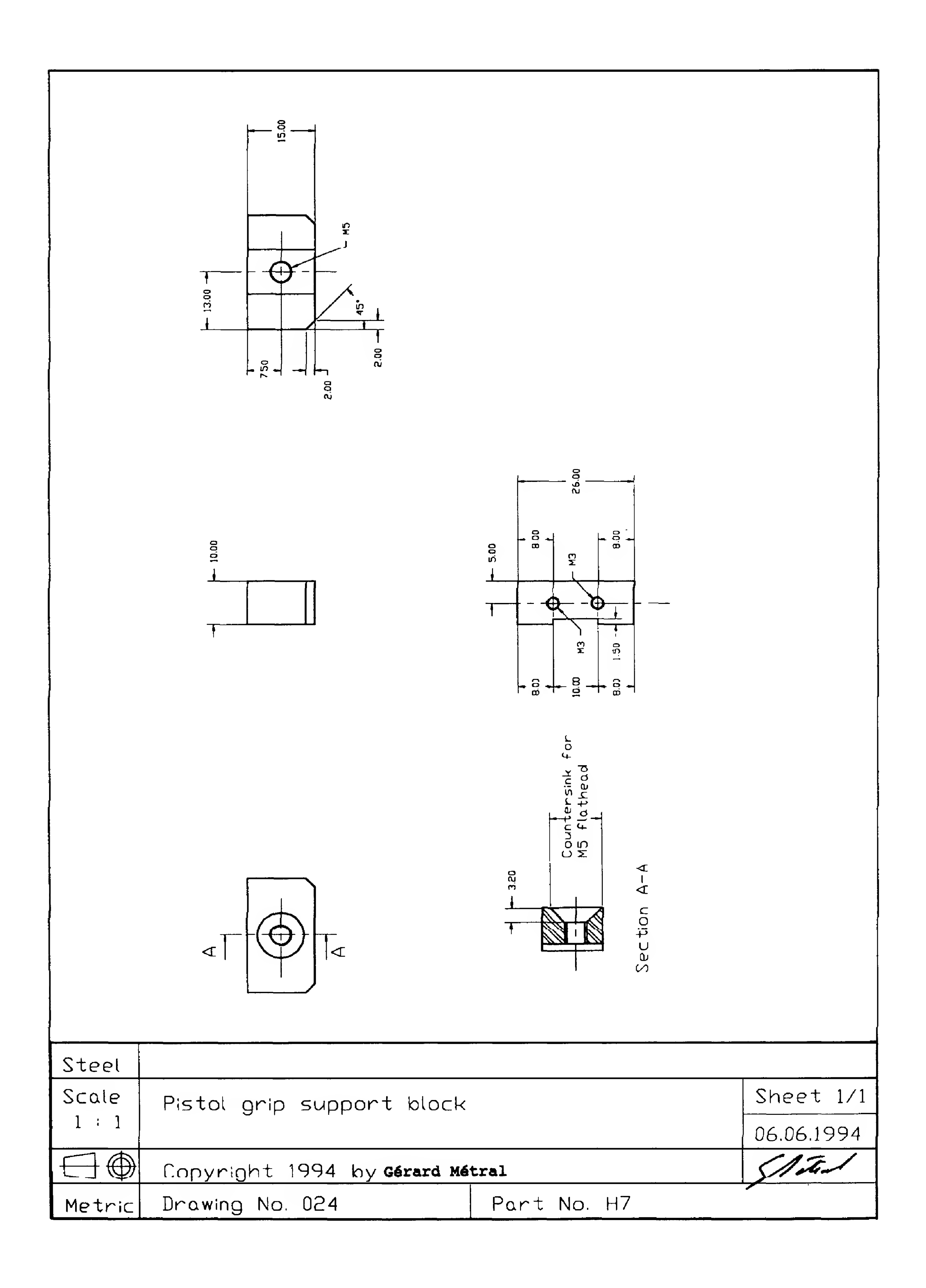

Right side
132.00
131.50
77.00
ø6.00
ø3.00
16.50
15.50
ø6.00
13.50
Countersink for M3 flathead
Top view
95.00
43.00
2.00
2.00
5.00
23.50
22.00
7.00
A
25.00
21.00
10.00
5.00
3.00
11.50
15.00
67.00
15.00
Left side
195.00
5.00
5.00
10.00
10.00
10.00
10.00
ø4.00
ø3.00
ø4.00
ø3.00
4.50
26.00
2.00
30.00
30.00
45°
0.50
Section A-A
Steel
L, 30x30mm, 2mm
Scale
1 : 1
Housing
Sheet 1/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 020
Part No. H1

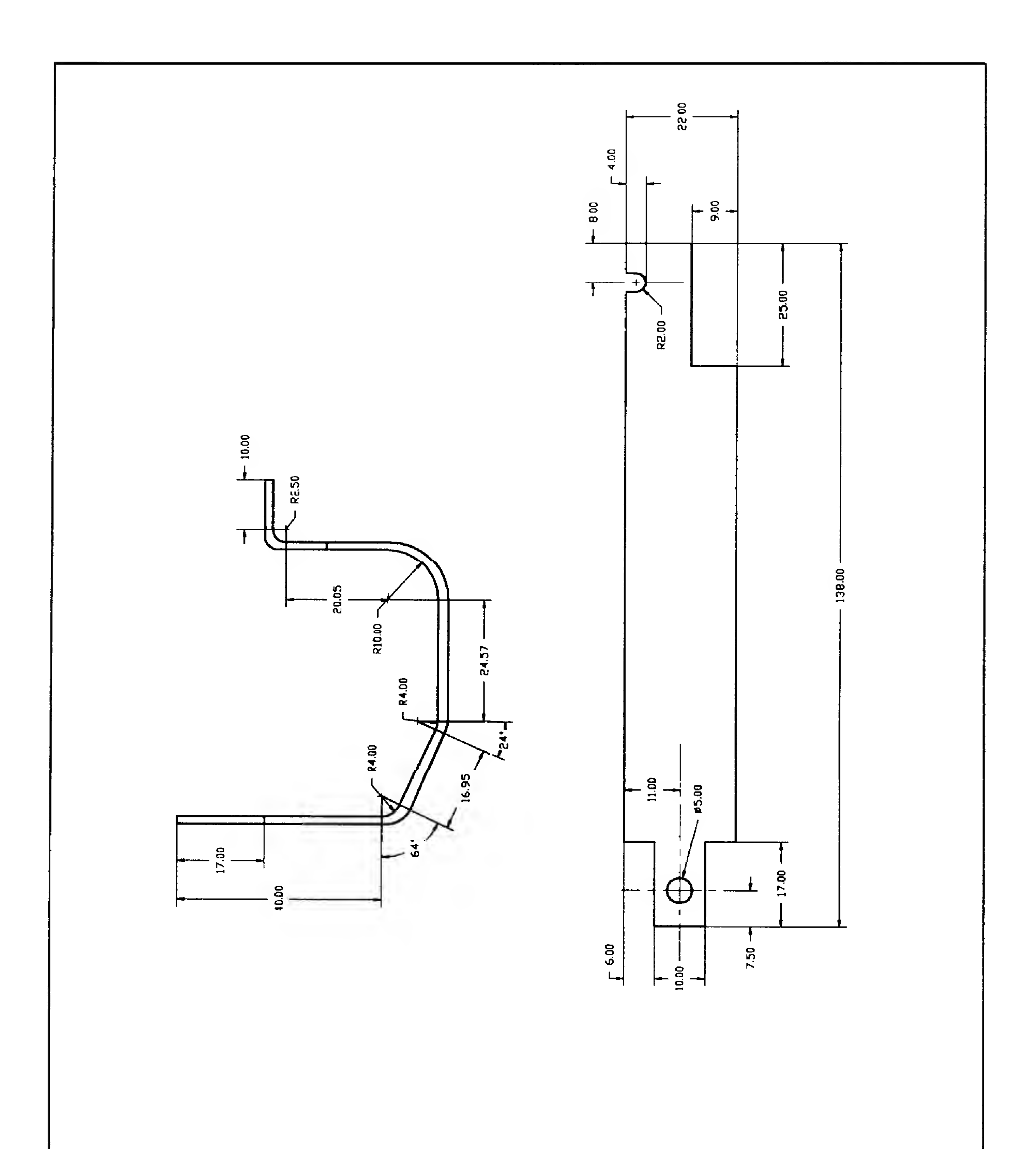

Seen from below
112.50
13.00
30.00
6.00
Countersink for M3 flathead
ø3.00
10.00
7.00
ø2.00
ø4.00
15.00
ø3.50
ø3.00
ø2.00
10.00
7.00
52.00
55.00
Countersink for M3 flathead
★ ENLARGE BY 150%
Steel
Scale
1 : 1
Housing
Sheet 2/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 021
Part No. H1


28.00
23.00
10.00
8.00
R19.00
A
A
26.00
30.00
2.00
Section A-A
front plate only
R2.50
5.00
10.00
10.00
2.00
16.0
11.00
15.00
10.00
M4
10.00
6.00
Steel
Scale
1 : 1
End plates
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 022
Part No. H2

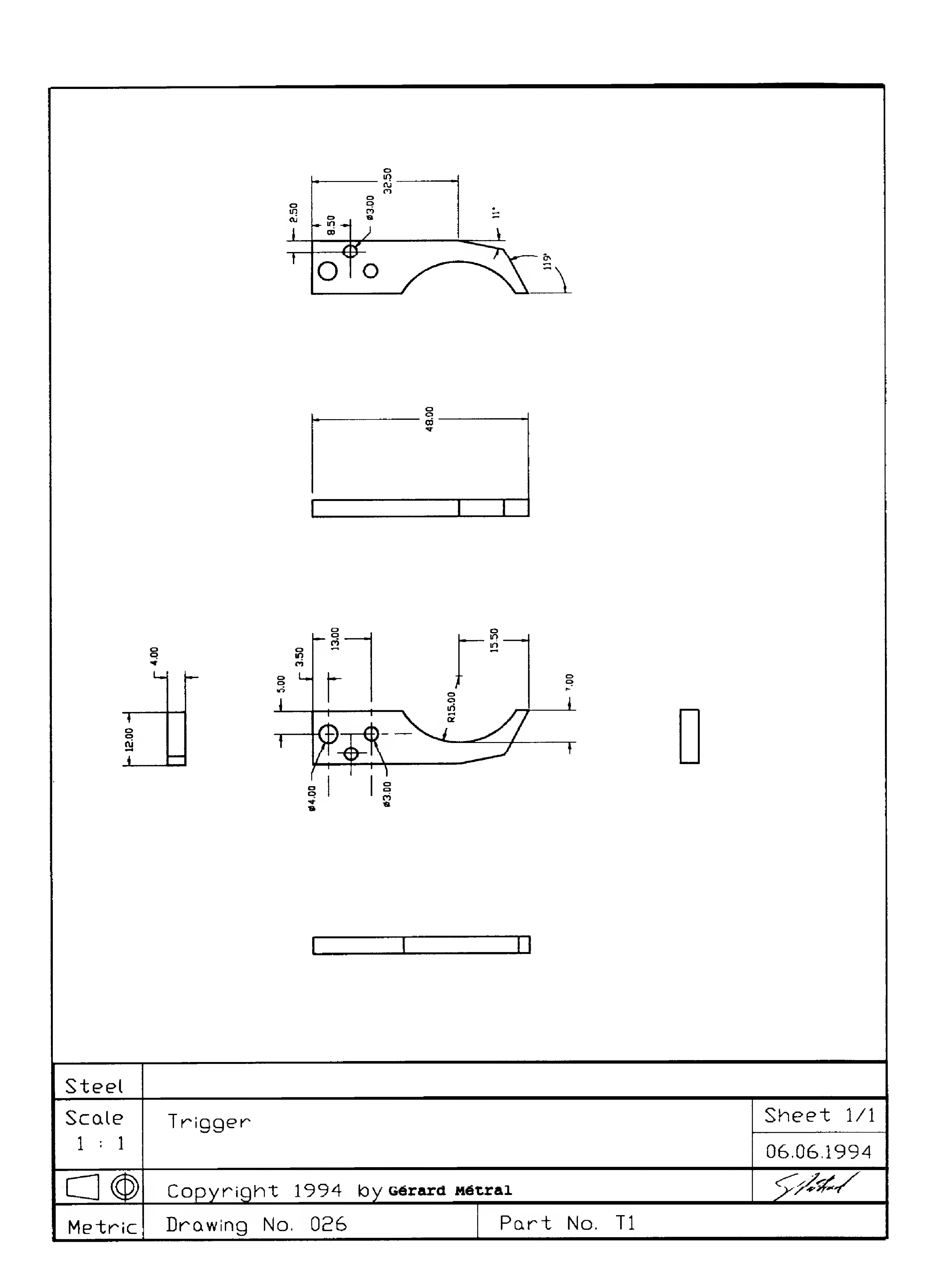


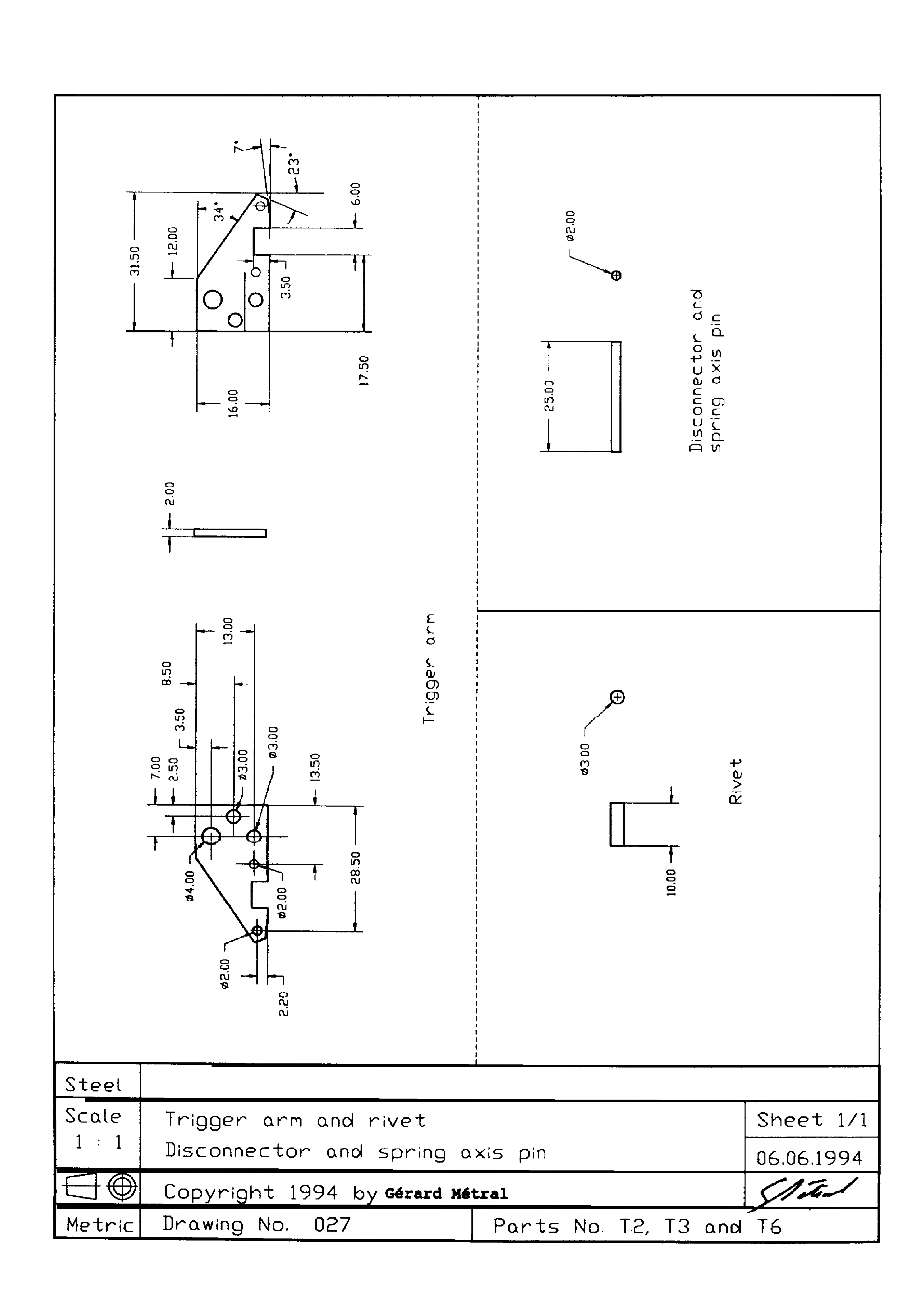
Front hook
25.00
6.00
10.00
5.00
ø4.00
ø4.00
16.00
17.00
90°
2.00
2.00
R1.00
R1.00
40mm plate forged
and trimmed to length
Rear hook
27.00
6.00
10.00
5.00
ø4.00
ø4.00
16.00
6.00
2.00
2.00
30mm plate forged
Steel
heat-treatable
Scale
1 : 1
Front and rear hooks
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 023
Parts No.H3 and H5

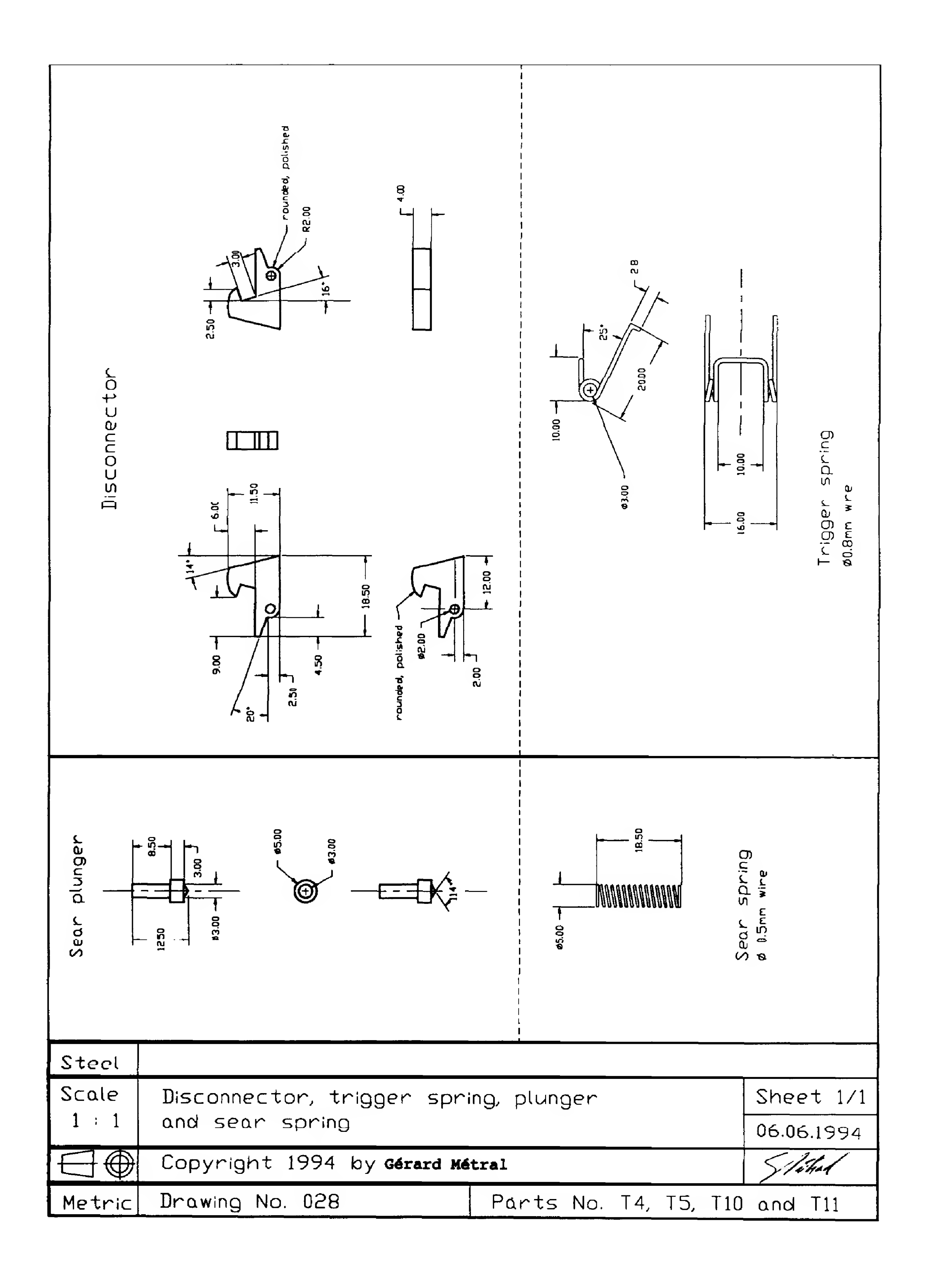

15.00
M5
13.00
45°
2.00
7.50
2.00
10.00
26.00
8.00
8.00
5.00
M3
M3
1.50
8.00
10.00
8.00
Countersink for
M5 flathead
3.20
Section A-A
A
A
Steel
Scale
1 : 1
Pistol grip support block
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 024
Part No. H7



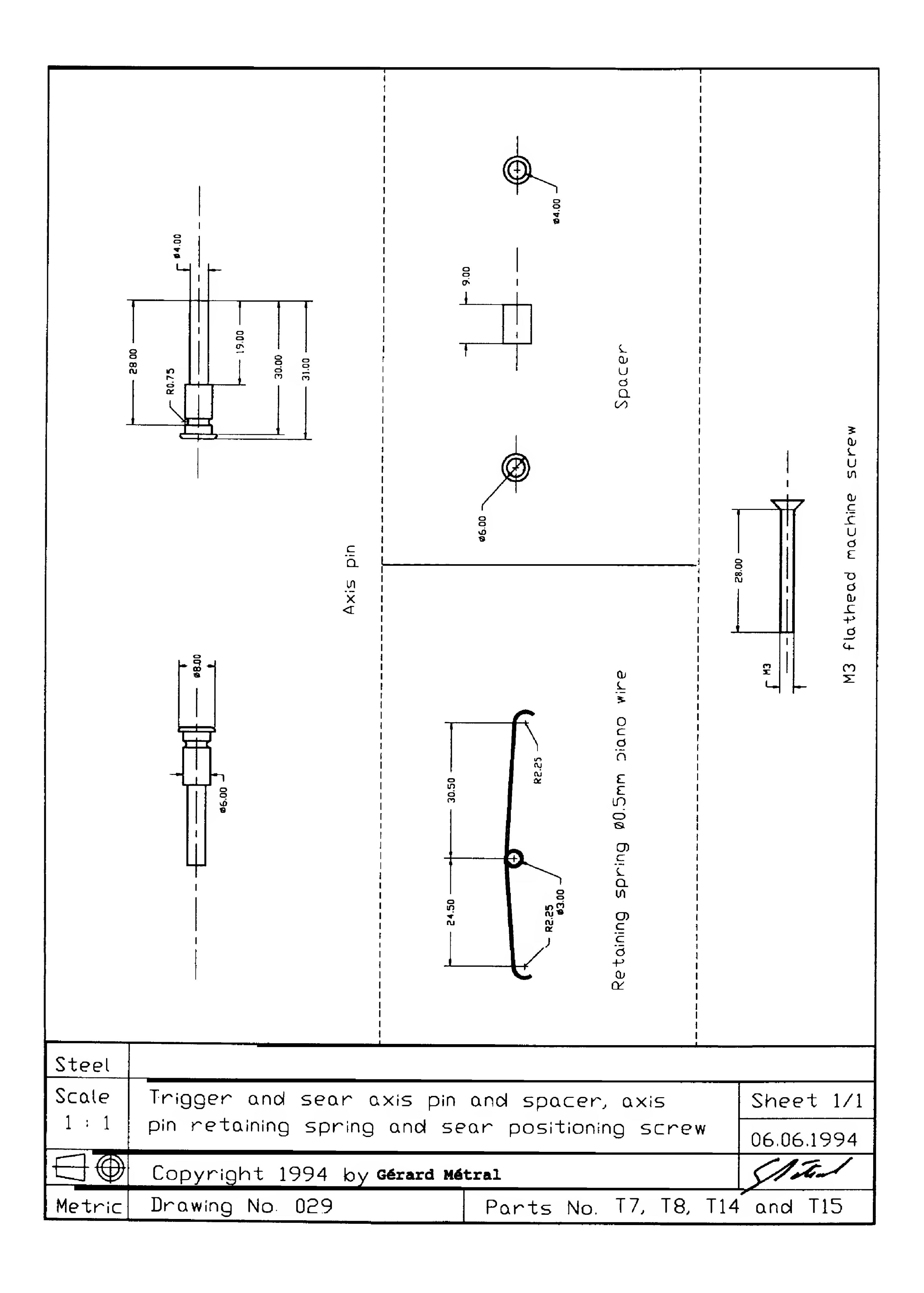
Steel	1.5mm sheet	
Scale 1 : 1	Trigger guard	Sheet 1/1
		06.06.1994
		[signature]
Metric	Drawing No. 025	Part No. H10

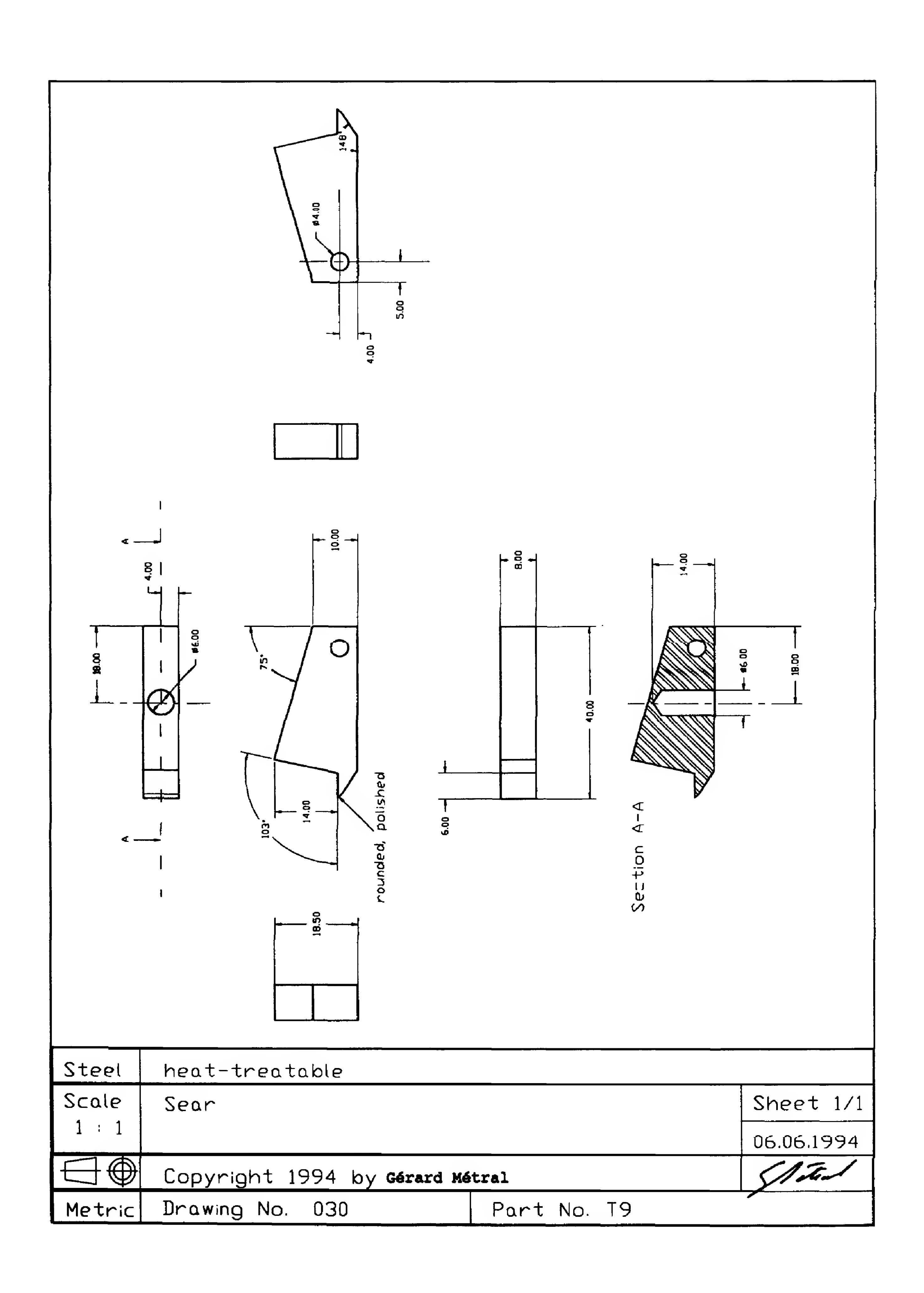

32.50
2.50
8.50
ø3.00
11°
119°
48.00
4.00
12.00
3.50
13.00
5.00
15.50
R15.00
7.00
ø4.00
ø3.00
Steel
Scale
1 : 1
Trigger
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 026
Part No. T1


Trigger arm
Disconnector and spring axis pin
Rivet
Steel
Scale
1 : 1
Trigger arm and rivet
Disconnector and spring axis pin
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 027
Parts No. T2, T3 and T6

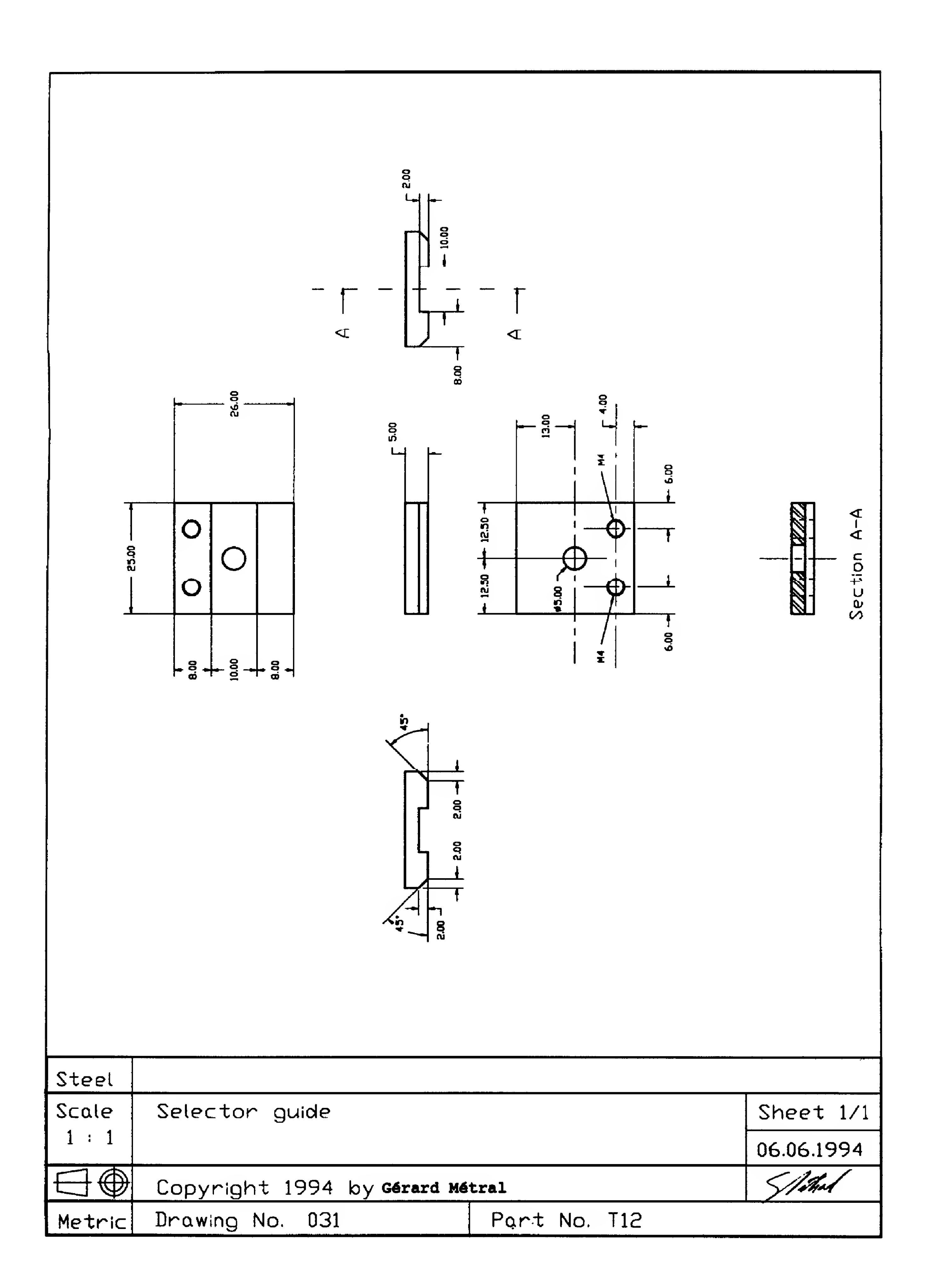


Disconnector
rounded, polished
R2.00
3.00
2.50
16°
4.00
6.00
11.50
14°
18.50
9.00
4.50
2.50
20°
12.00
rounded, polished
ø2.00
2.00
Trigger spring
Ø0.8mm wire
28
25°
20.00
10.00
ø3.00
10.00
16.00
Sear plunger
8.50
3.00
12.50
ø3.00
ø5.00
ø3.00
14°
Sear spring
ø 0.5mm wire
18.50
ø5.00
Steel
Scale
1 : 1
Disconnector, trigger spring, plunger
and sear spring
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 028
Parts No. T4, T5, T10 and T11

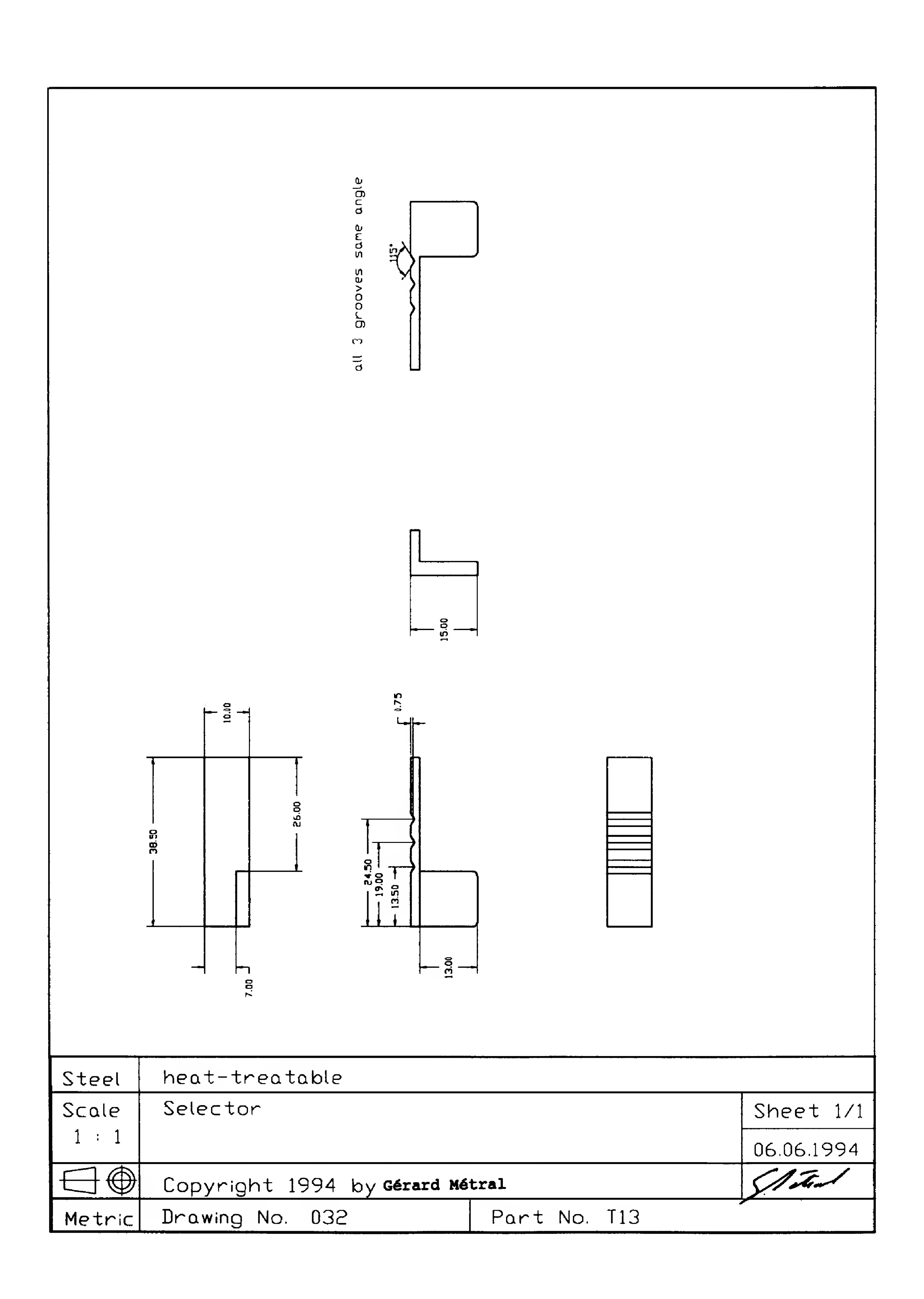

Axis pin
ø4.00
28.00
19.00
30.00
31.00
R0.75
ø8.00
ø6.00
Spacer
ø4.00
9.00
ø6.00
M3 flathead machine screw
28.00
M3
Retaining spring ø0.5mm piano wire
30.50
24.50
R2.25
R2.25
ø3.00
Steel
Scale
1 : 1
Trigger and sear axis pin and spacer, axis pin retaining spring and sear positioning screw
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 029
Parts No. T7, T8, T14 and T15

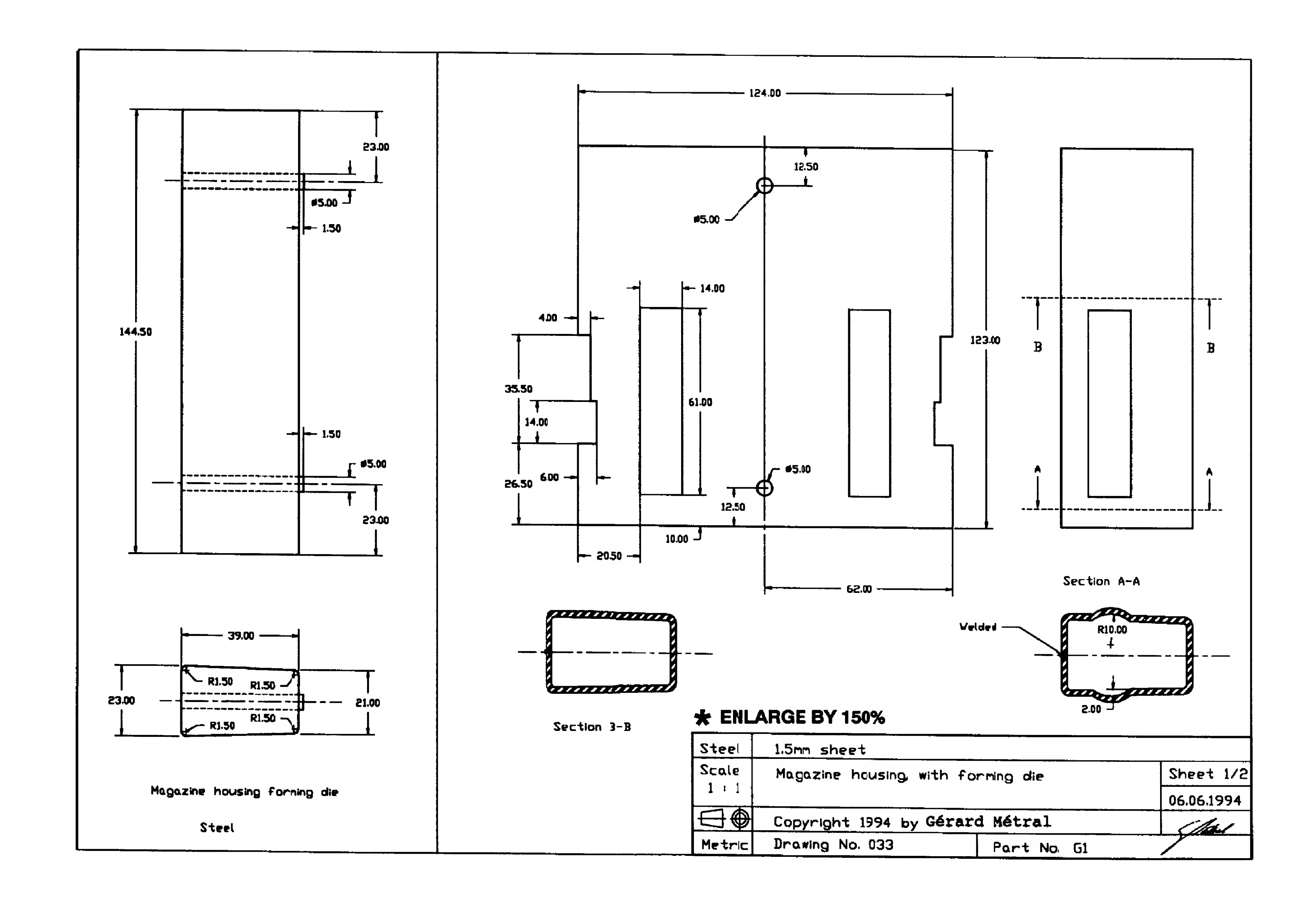


148°
ø4.00
5.00
4.00
10.00
4.00
A
A
18.00
ø6.00
75°
103°
14.00
rounded, polished
8.00
40.00
6.00
14.00
ø6.00
18.00
Section A-A
18.50
Steel
heat-treatable
Scale
1 : 1
Sear
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 030
Part No. T9

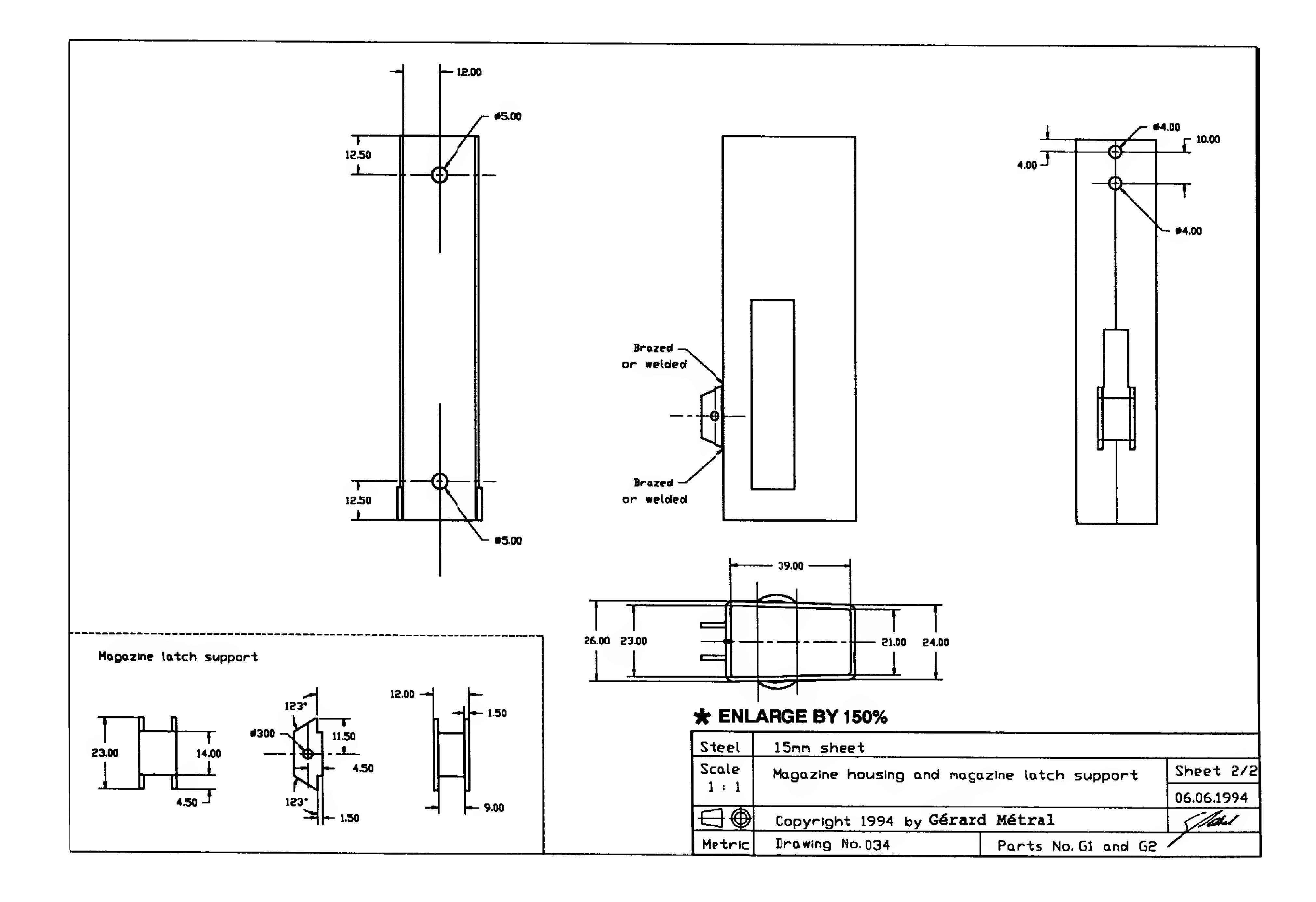


2.00
10.00
8.00
A
A
26.00
5.00
13.00
4.00
M4
6.00
25.00
12.50
12.50
ø5.00
M4
6.00
Section A-A
8.00
10.00
8.00
45°
2.00
2.00
45°
2.00
Steel
Scale
1 : 1
Selector guide
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 031
Part No. T12

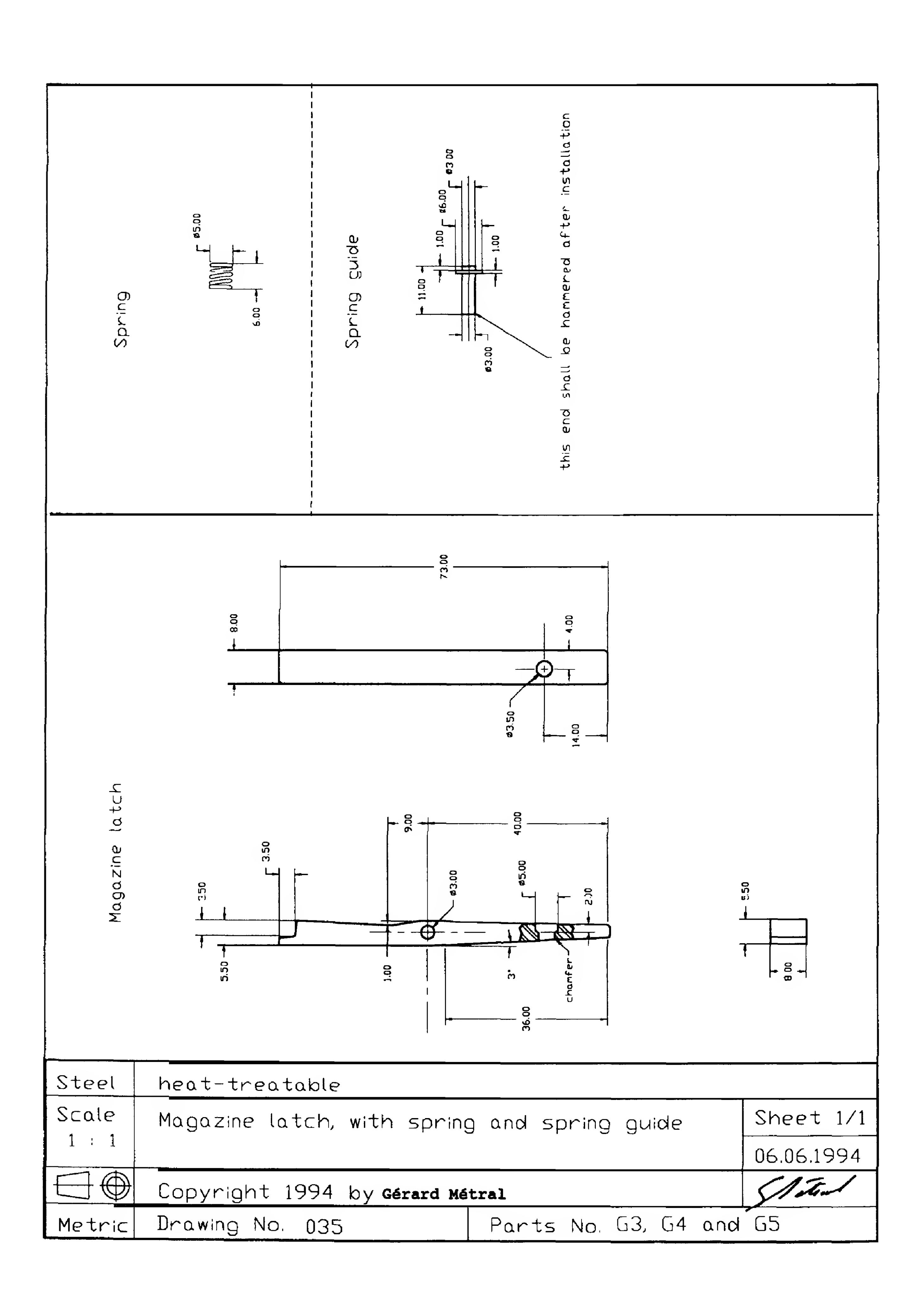

all 3 grooves same angle
115°
15.00
0.75
10.00
38.50
26.00
24.50
19.00
13.50
7.00
13.00
Steel
heat-treatable
Scale
1 : 1
Selector
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 032
Part No. T13

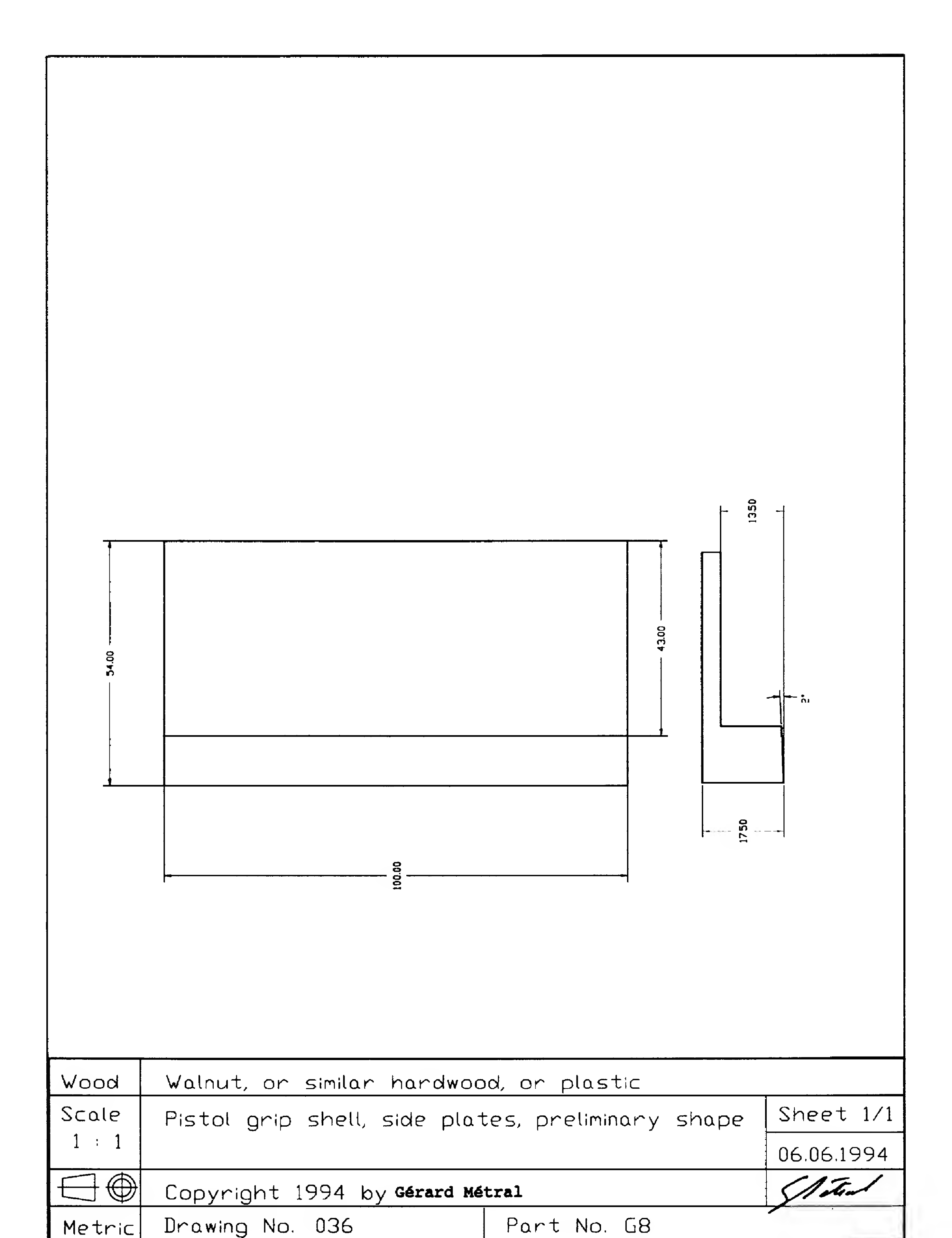


23.00
ø5.00
1.50
144.50
1.50
ø5.00
23.00
39.00
R1.50
R1.50
23.00
21.00
R1.50
R1.50
Magazine housing forming die
Steel
124.00
12.50
ø5.00
14.00
4.00
35.50
14.00
61.00
123.00
ø5.00
6.00
26.50
12.50
10.00
20.50
62.00
B
B
A
A
Section A-A
Velded
R10.00
2.00
Section 3-B
* ENLARGE BY 150%
Steel
1.5mm sheet
Scale
1 : 1
Magazine housing with forming die
Sheet 1/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 033
Part No. G1

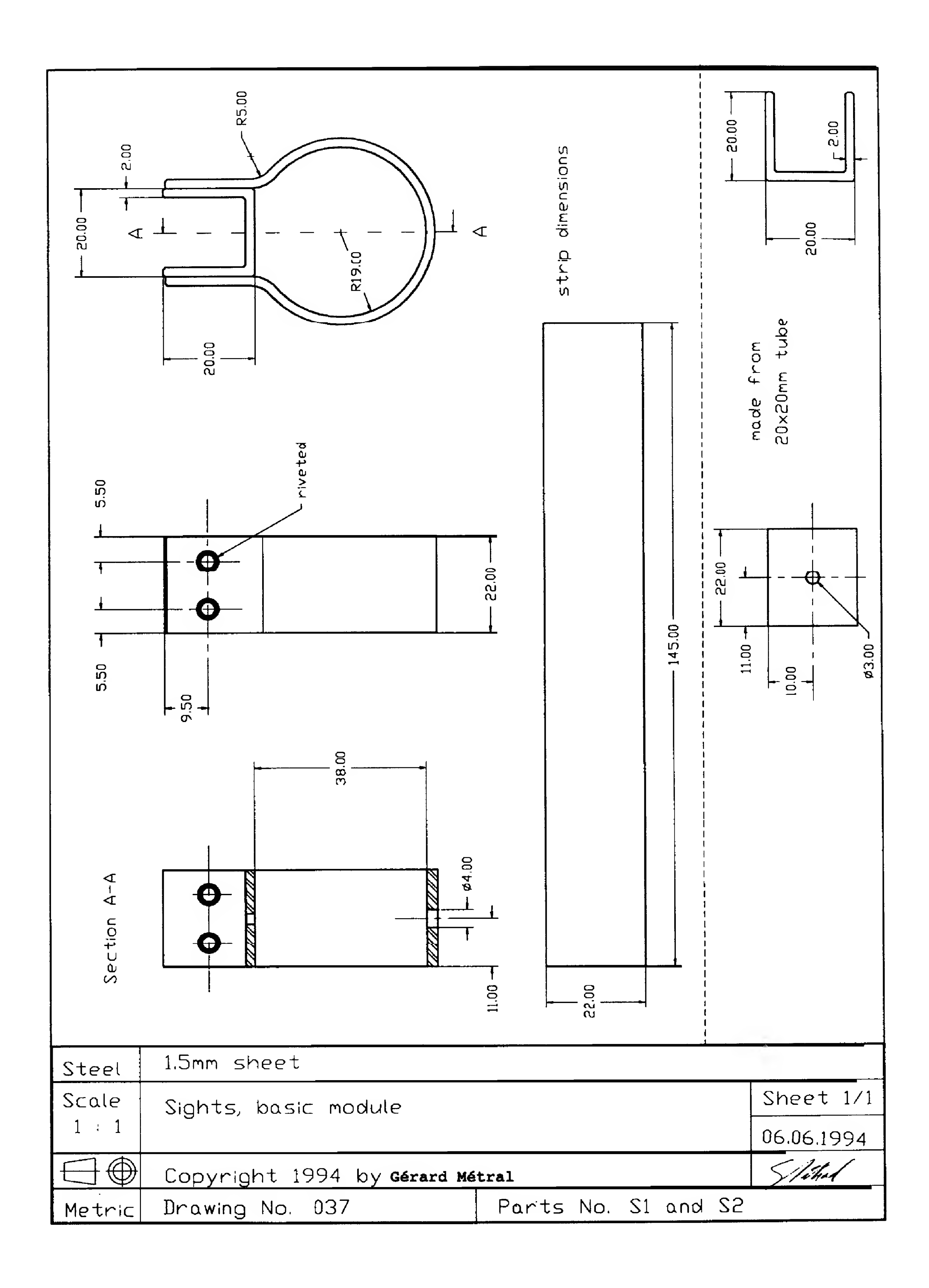


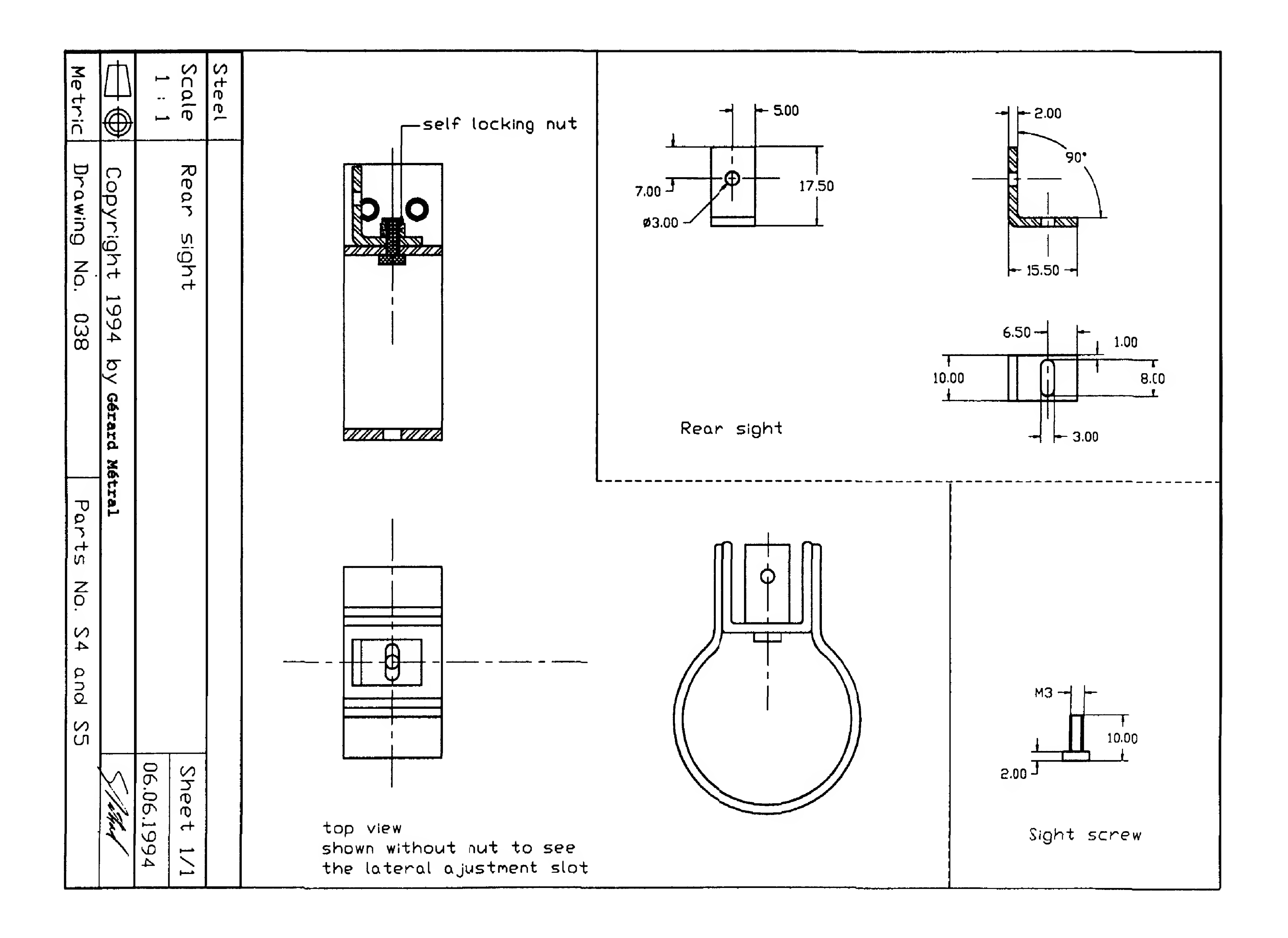
12.00
ø5.00
12.50
12.50
ø5.00
Brazed or welded
Brazed or welded
ø4.00
10.00
4.00
ø4.00
39.00
26.00
23.00
21.00
24.00
Magazine latch support
23.00
14.00
4.50
123°
ø300
11.50
4.50
123°
1.50
12.00
1.50
9.00
* ENLARGE BY 150%
Steel
15mm sheet
Scale 1 : 1
Magazine housing and magazine latch support
Sheet 2/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 034
Parts No. G1 and G2

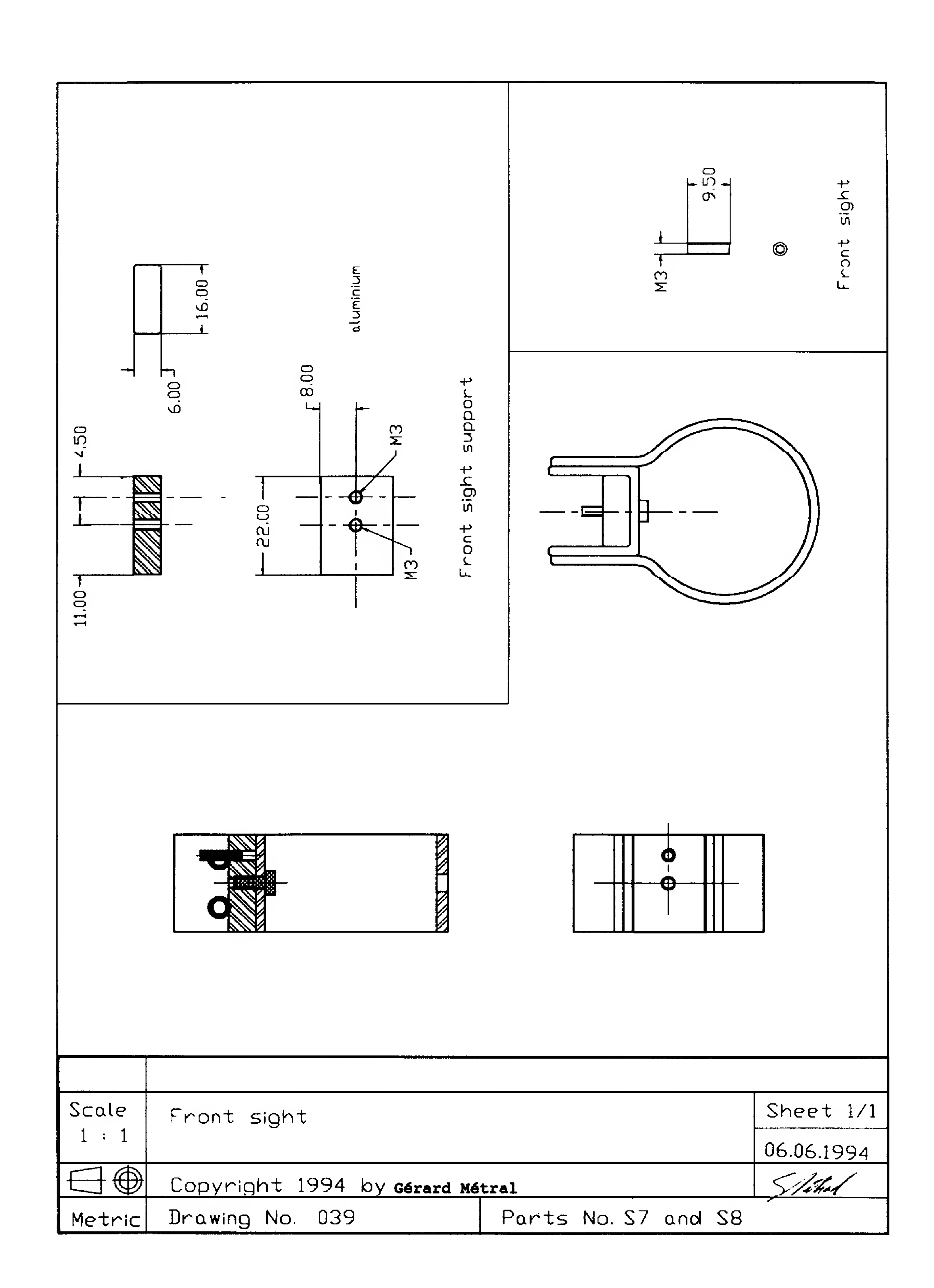

Spring
ø5.00
6.00
Spring guide
ø3.00
ø6.00
1.00
1.00
11.00
ø3.00
this end shall be hammered after installation
Magazine latch
73.00
8.00
4.00
ø3.50
14.00
9.00
40.00
3.50
ø3.00
ø5.00
5.50
1.00
3°
chamfer
36.00
8.00
Steel
heat-treatable
Scale
1 : 1
Magazine latch, with spring and spring guide
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 035
Parts No. G3, G4 and G5



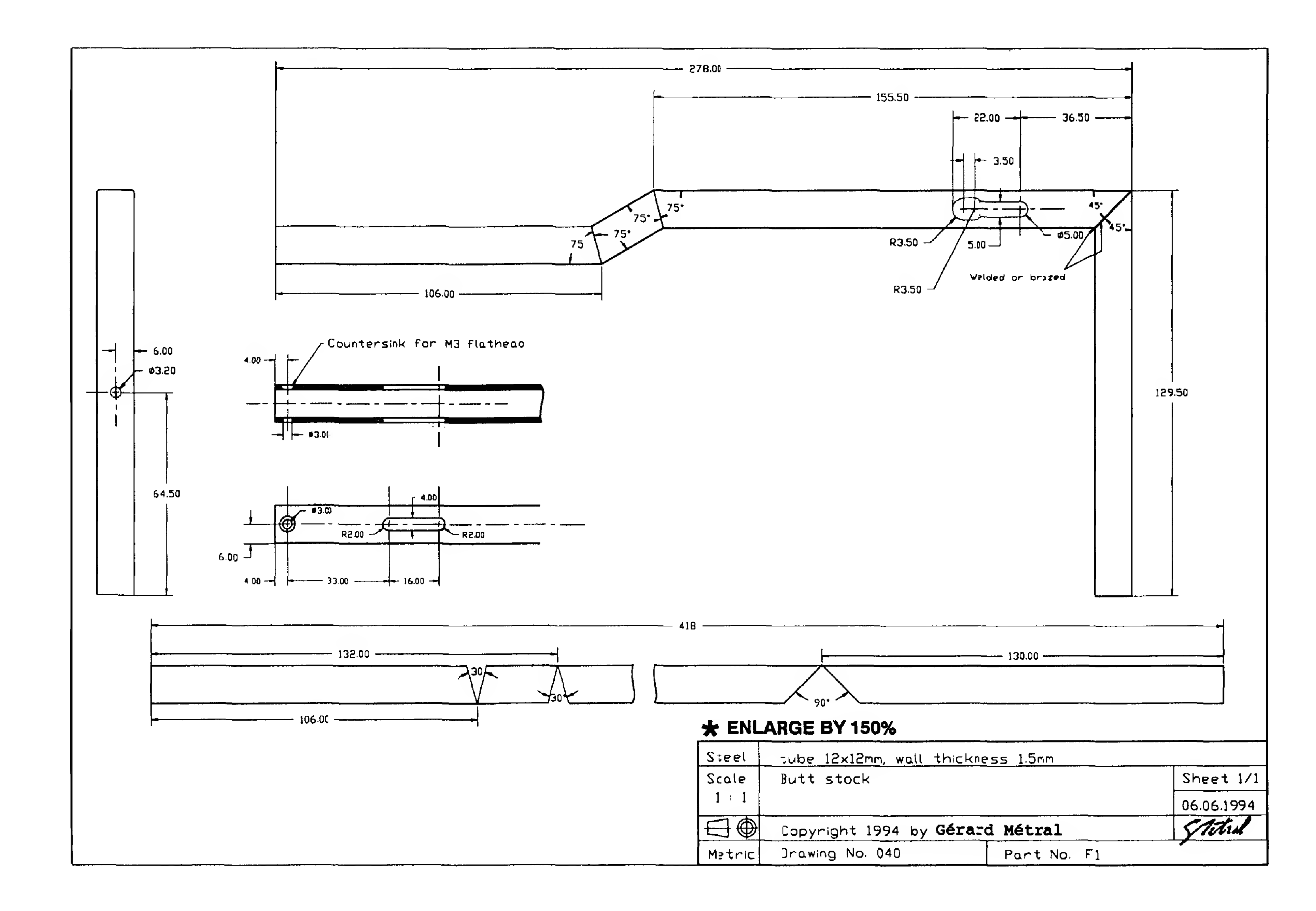
54.00
43.00
100.00
1350
2°
1750
Wood
Walnut, or similar hardwood, or plastic
Scale
1 : 1
Pistol grip shell, side plates, preliminary shape
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 036
Part No. G8


R5.00
2.00
20.00
A
A
R19.00
20.00
strip dimensions
20.00
2.00
20.00
made from
20x20mm tube
riveted
5.50
22.00
5.50
9.50
145.00
22.00
11.00
10.00
ø3.00
38.00
Section A-A
ø4.00
11.00
22.00
Steel
1.5mm sheet
Scale
1 : 1
Sights, basic module
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 037
Parts No. S1 and S2


self locking nut
5.00
7.00
17.50
ø3.00
2.00
90°
15.50
6.50
1.00
10.00
8.00
3.00
Rear sight
M3
10.00
2.00
Sight screw
top view
shown without nut to see
the lateral ajustment slot
Steel
Scale
1 : 1
Rear sight
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 038
Parts No. S4 and S5

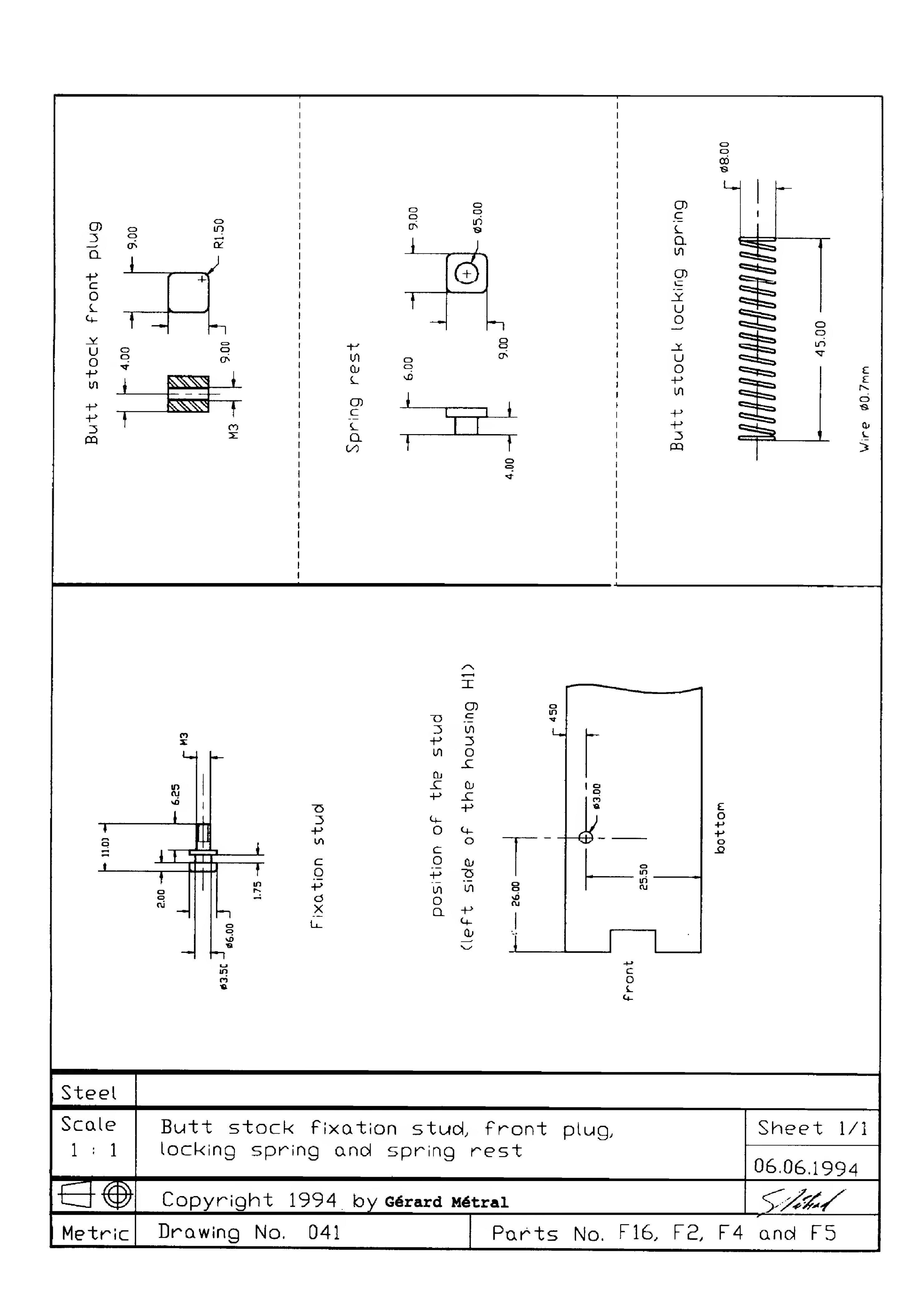


16.00
6.00
aluminium
4.50
11.00
22.00
8.00
M3
M3
Front sight support
9.50
M3
Front sight
Scale
1 : 1
Front sight
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 039
Parts No. S7 and S8

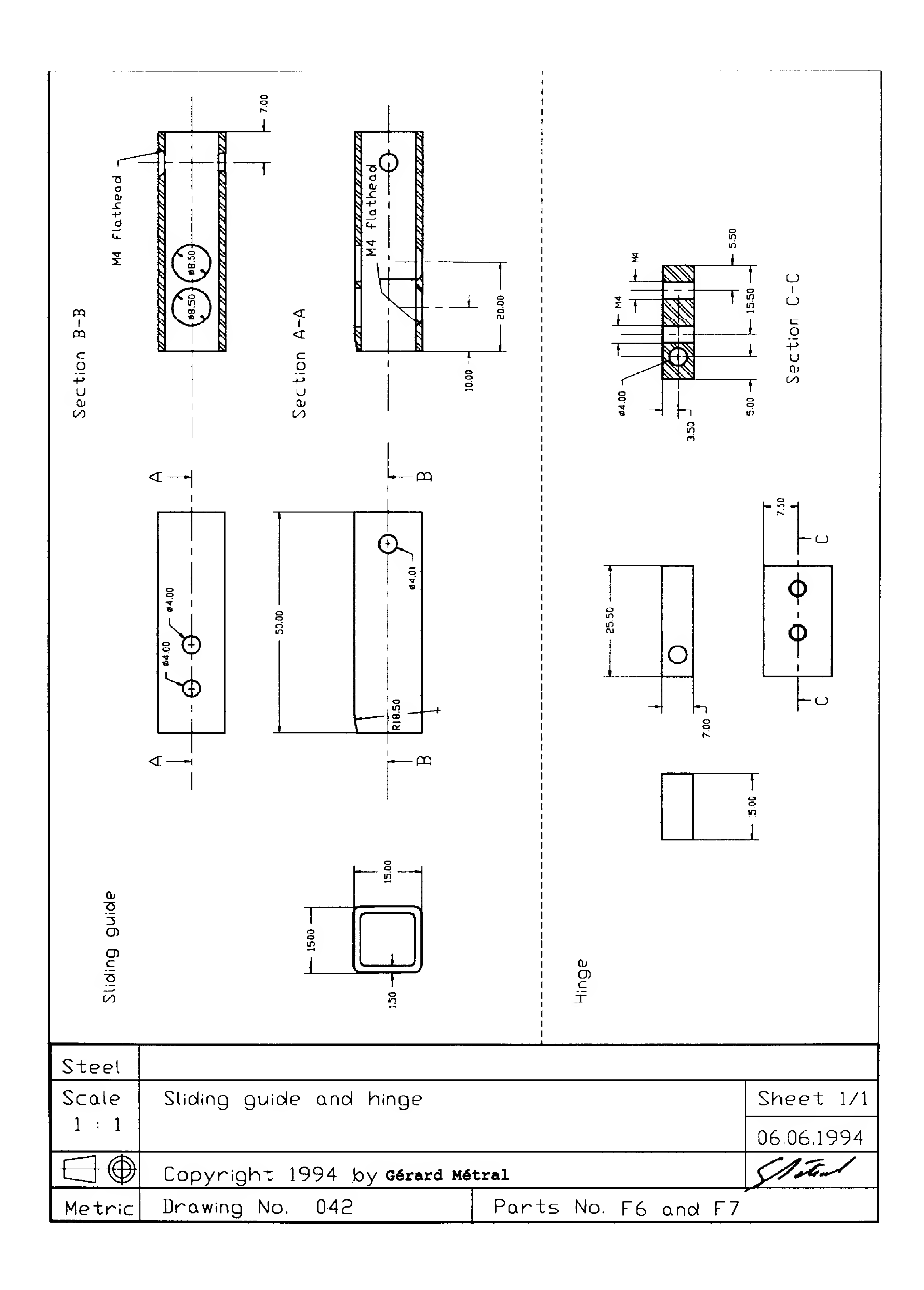


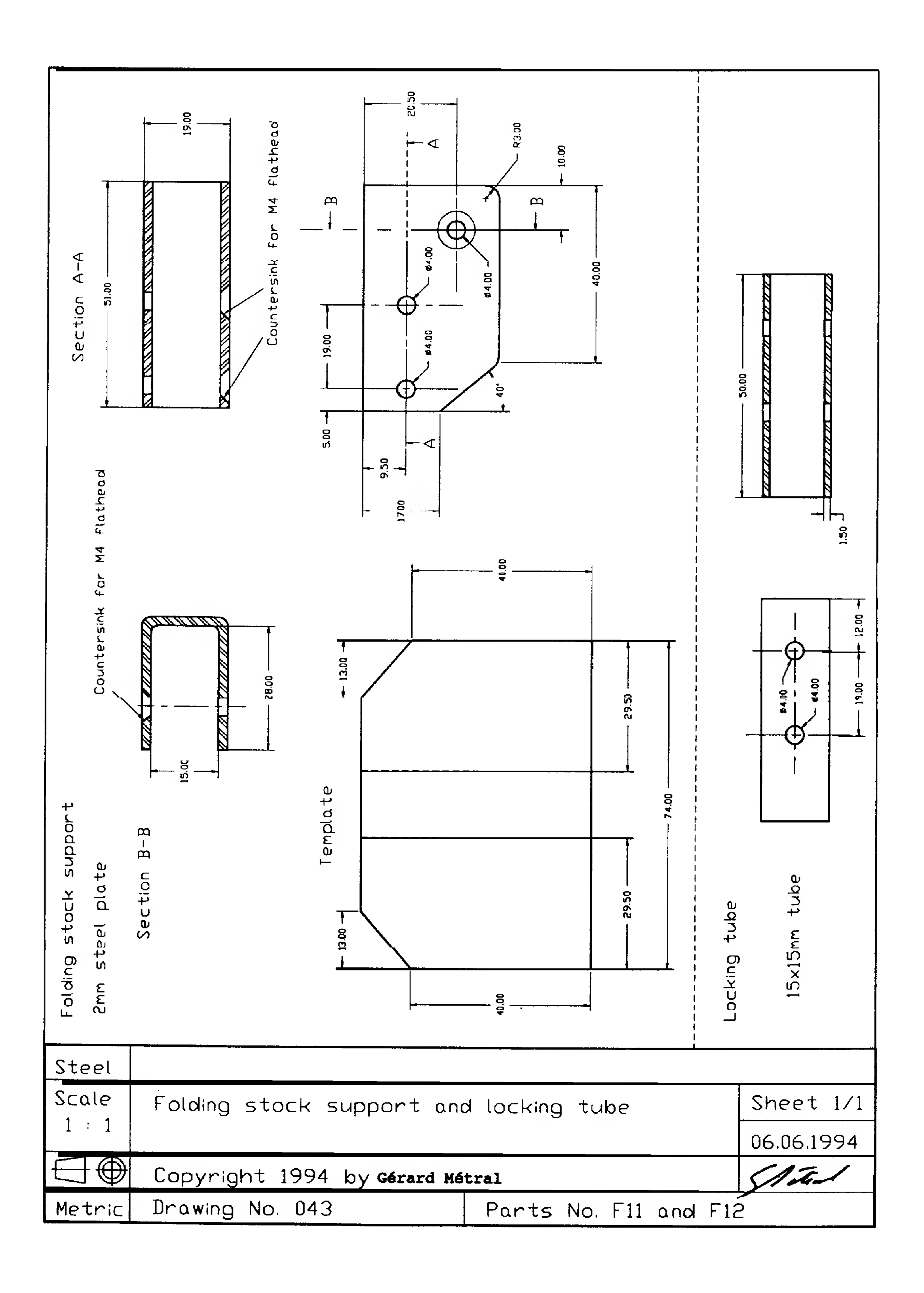
★ ENLARGE BY 150%

Steel	Tube 12x12mm, wall thickness 1.5mm	
Scale 1 : 1	Butt stock	Sheet 1/1
		06.06.1994
Metric	Drawing No. 040	Part No. F1

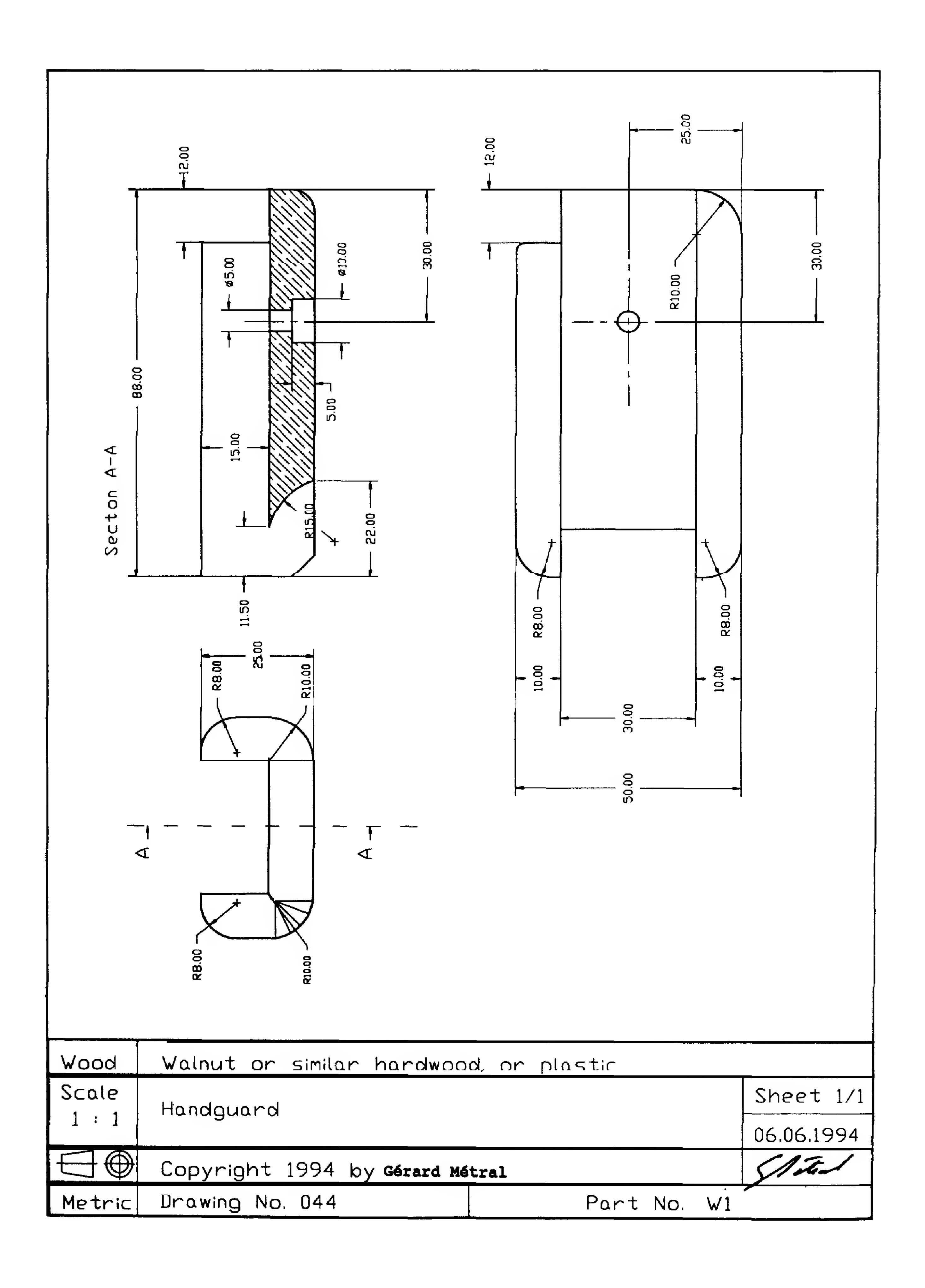


Butt stock front plug
9.00
R1.50
4.00
9.00
M3
Spring rest
9.00
ø5.00
6.00
9.00
4.00
Butt stock locking spring
ø8.00
45.00
Wire ø0.7mm
Fixation stud
M3
6.25
11.00
2.00
1.75
ø6.00
ø3.5C
position of the stud
(left side of the housing H1)
450
ø3.00
26.00
25.50
bottom
front
Steel
Scale
1 : 1
Butt stock fixation stud, front plug, locking spring and spring rest
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 041
Parts No. F16, F2, F4 and F5

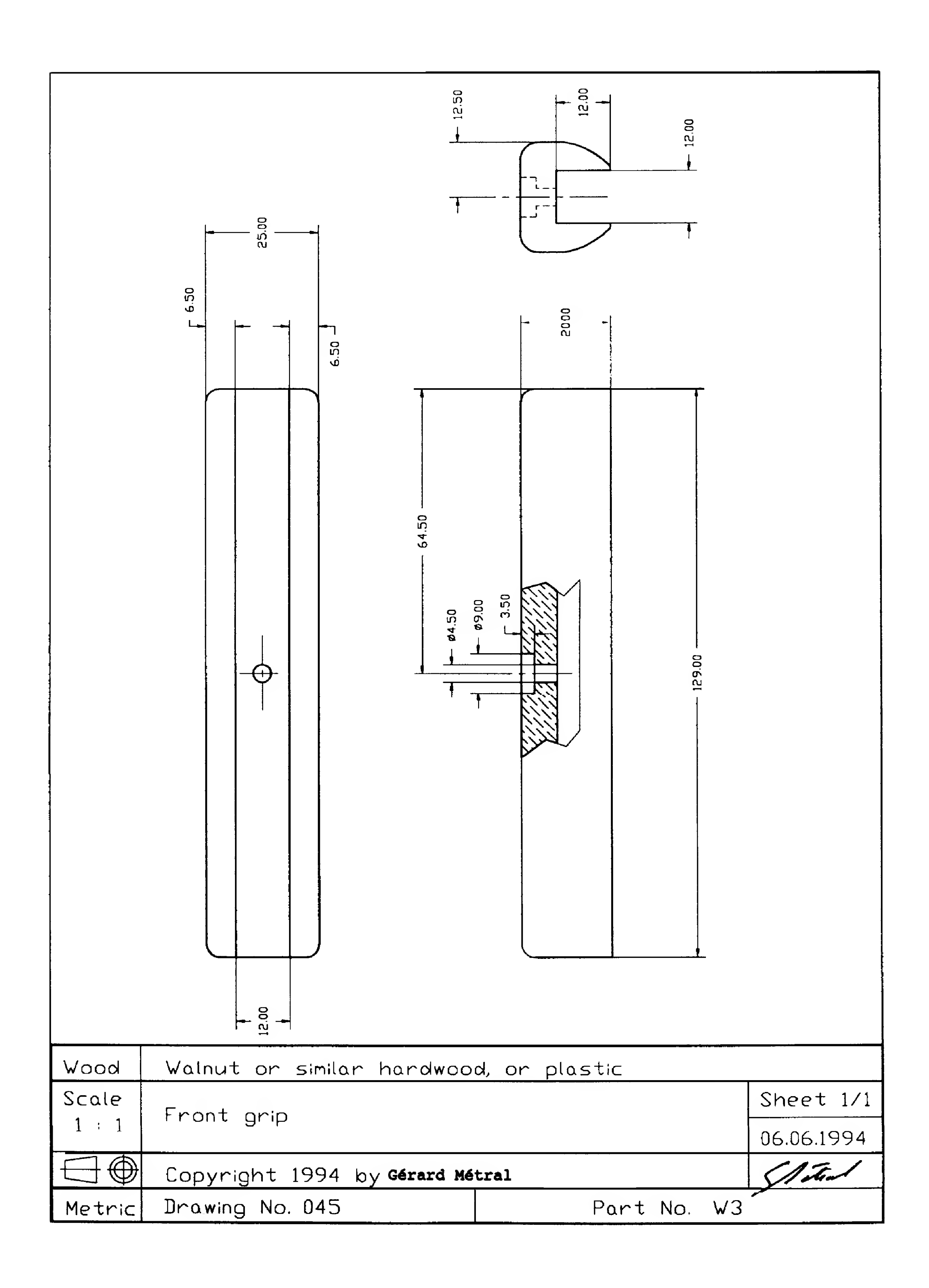

Section B-B
M4 flathead
ø8.50
ø8.50
7.00
Section A-A
M4 flathead
20.00
10.00
A
A
B
B
ø4.00
ø4.00
50.00
ø4.00
R18.50
Sliding guide
15.00
1500
1.50
Hinge
Section C-C
M4
M4
5.50
15.50
ø4.00
3.50
5.00
25.50
7.00
7.50
C
C
15.00
Steel
Scale
1 : 1
Sliding guide and hinge
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 042
Parts No. F6 and F7

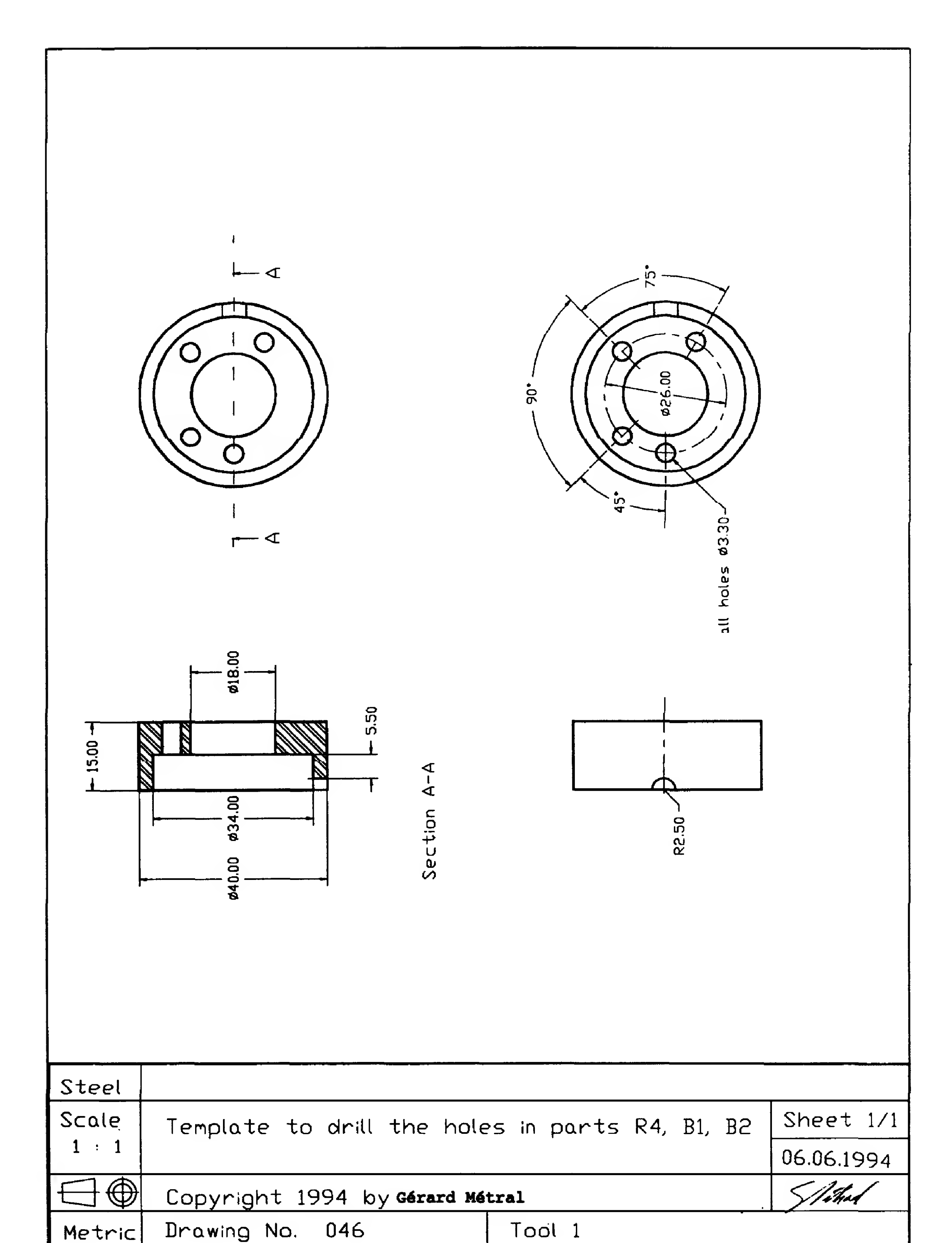


Section A-A
Countersink for M4 flathead
Countersink for M4 flathead
Folding stock support
2mm steel plate
Section B-B
Template
Locking tube
15x15mm tube
19.00
51.00
20.50
R3.00
10.00
40.00
ø4.00
19.00
5.00
9.50
17.00
40°
50.00
1.50
28.00
15.00
13.00
29.50
74.00
12.00
A
B
Steel
Scale
1 : 1
Folding stock support and locking tube
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 043
Parts No. F11 and F12

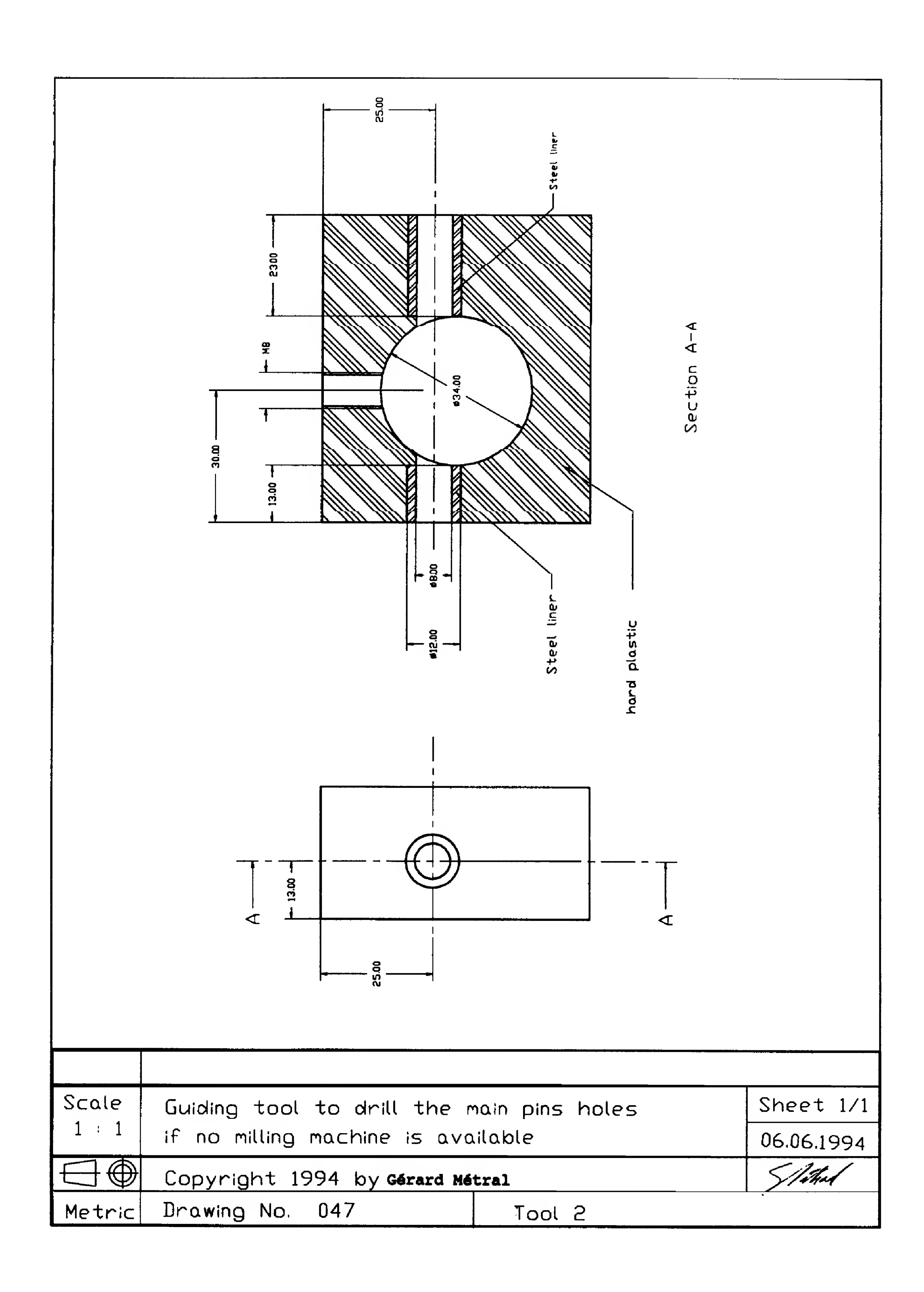


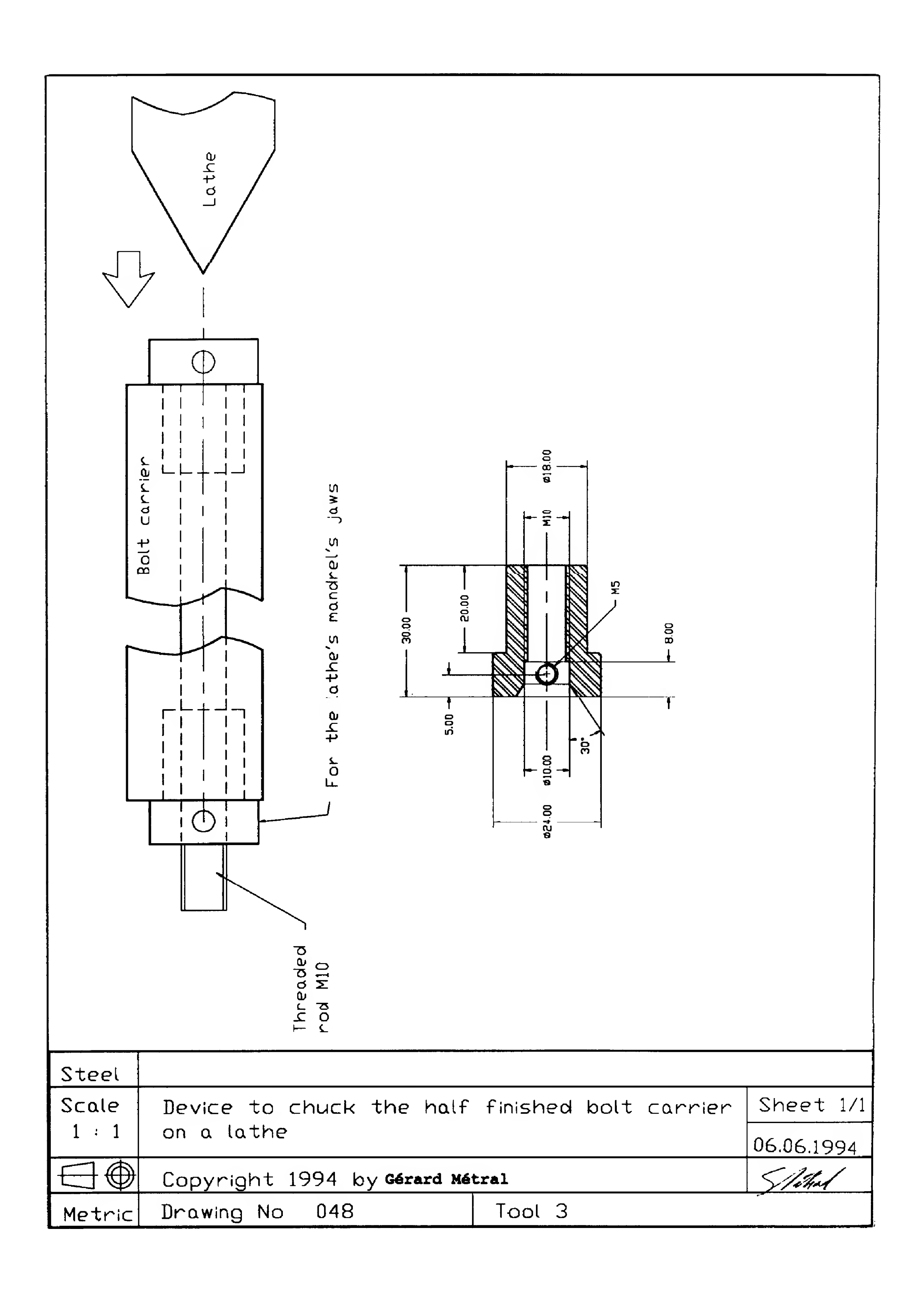
Secton A-A
12.00
30.00
ø5.00
ø13.00
88.00
5.00
15.00
22.00
R15.00
11.50
25.00
R8.00
R10.00
A
A
25.00
12.00
30.00
R10.00
R8.00
R8.00
10.00
10.00
30.00
50.00
Wood
Walnut or similar hardwood, or plastic
Scale
1 : 1
Handguard
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 044
Part No. W1


12.50
12.00
12.00
25.00
6.50
6.50
2000
64.50
ø4.50
ø9.00
3.50
129.00
12.00
Wood
Walnut or similar hardwood, or plastic
Scale
1 : 1
Front grip
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 045
Part No. W3

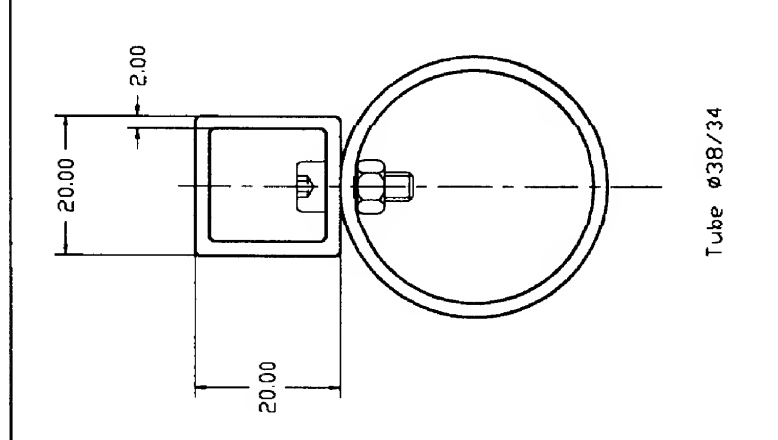


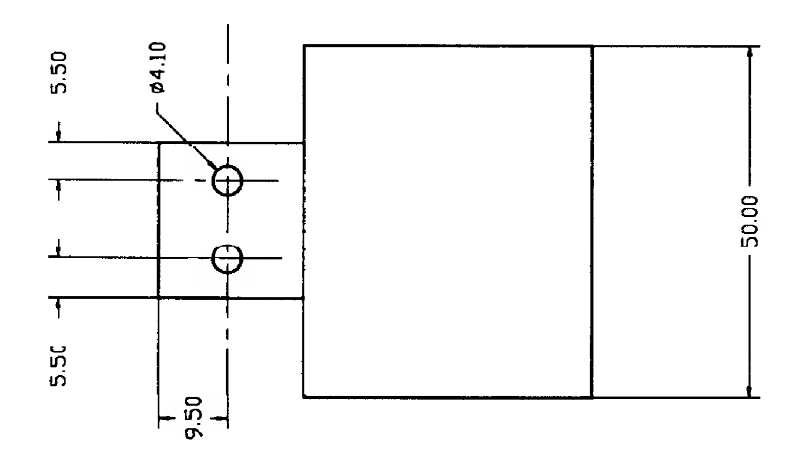
Steel		
Scale 1 : 1	Template to drill the holes in parts R4, B1, B2	Sheet 1/1
		06.06.1994
Metric	Drawing No. 046	Tool 1


25.00
Steel liner
23.00
M8
ø34.00
30.00
13.00
ø8.00
ø12.00
Steel liner
hard plastic
Section A-A
A
13.00
A
25.00
Scale
1 : 1
Guiding tool to drill the main pins holes
if no milling machine is available
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 047
Tool 2

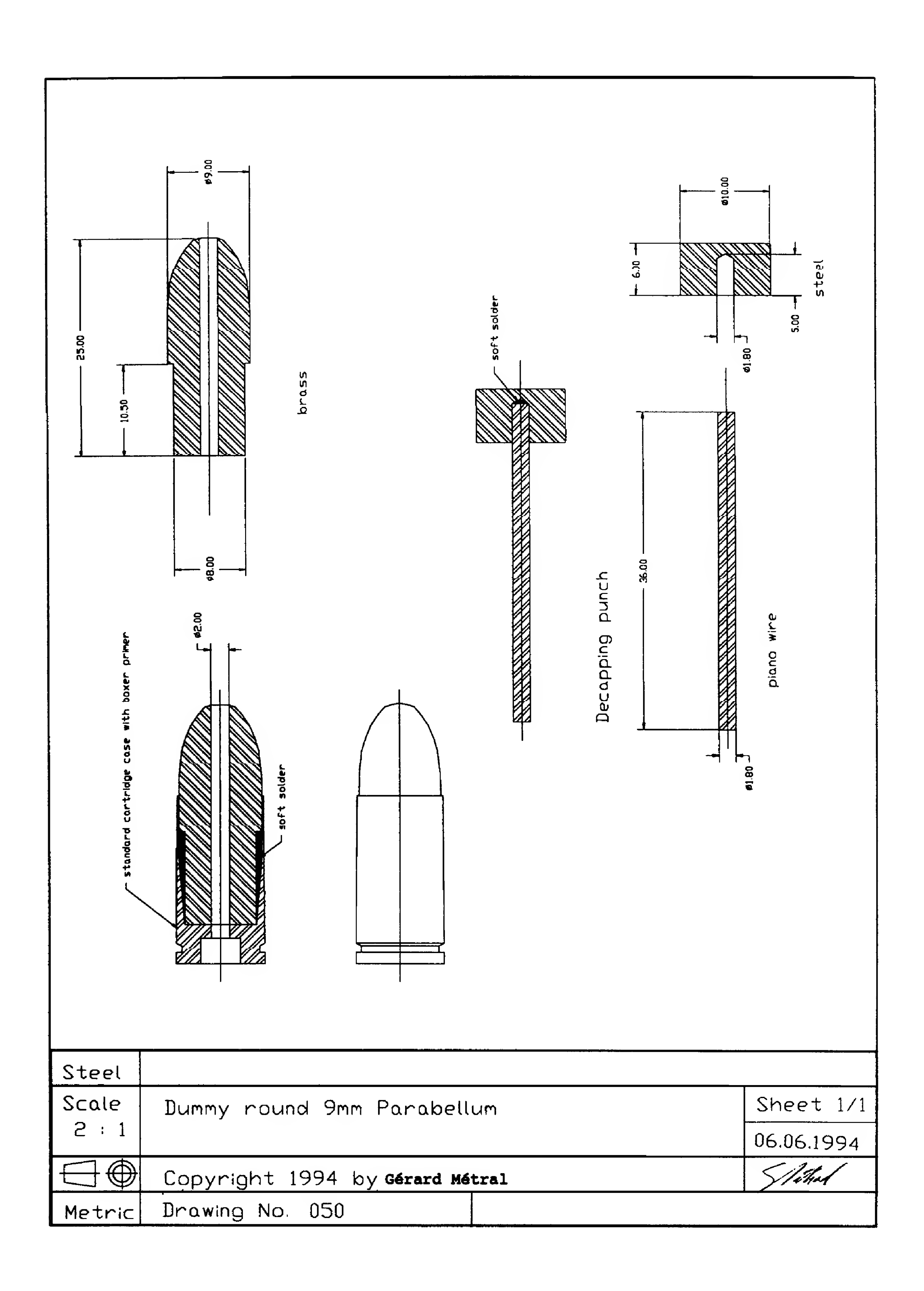


Lathe
Bolt carrier
For the lathe's mandrel's jaws
Threaded rod M10
ø18.00
M10
M5
30.00
20.00
8.00
5.00
30°
ø10.00
ø24.00
Steel
Scale 1 : 1
Device to chuck the half finished bolt carrier on a lathe
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No 048
Tool 3

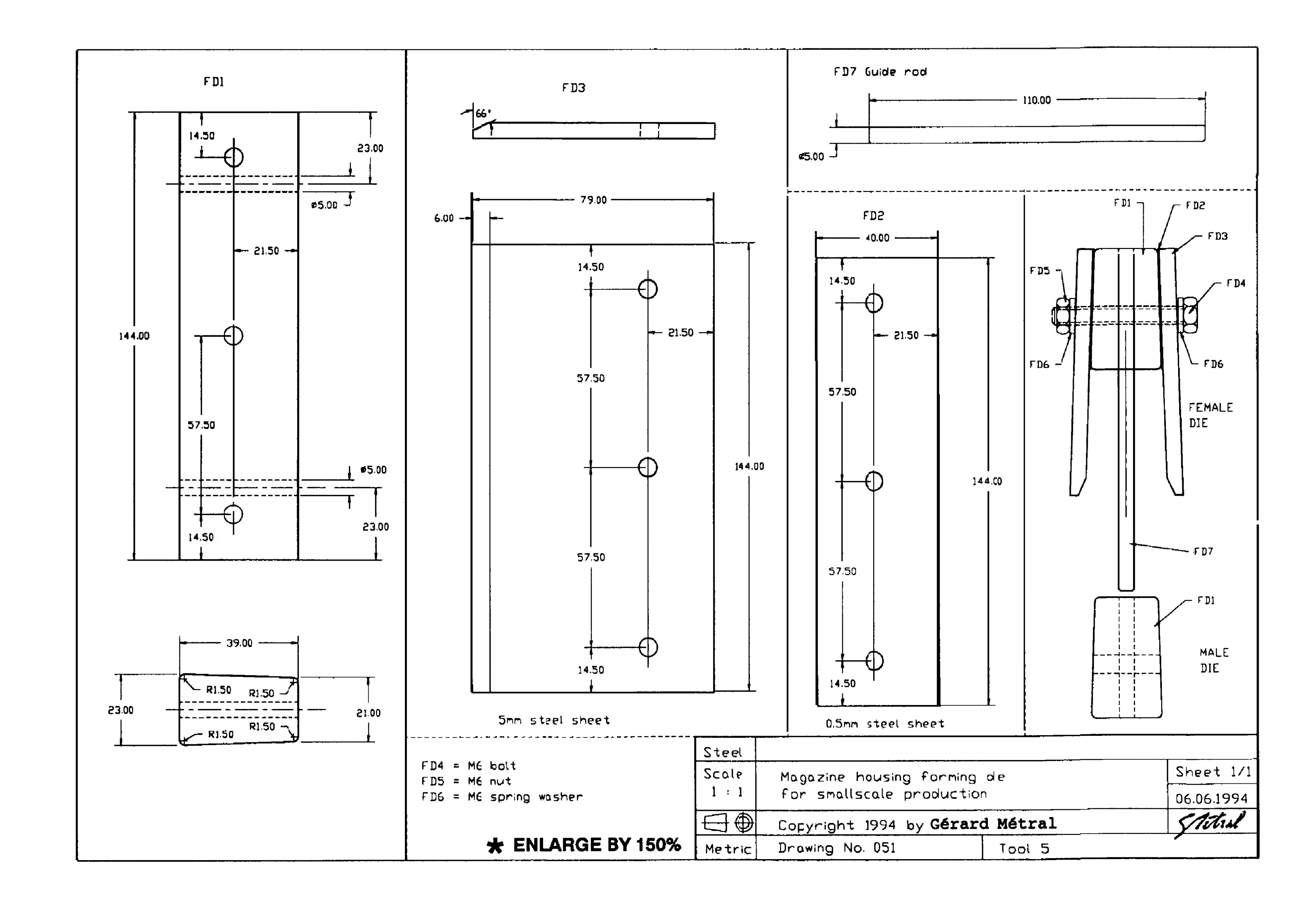




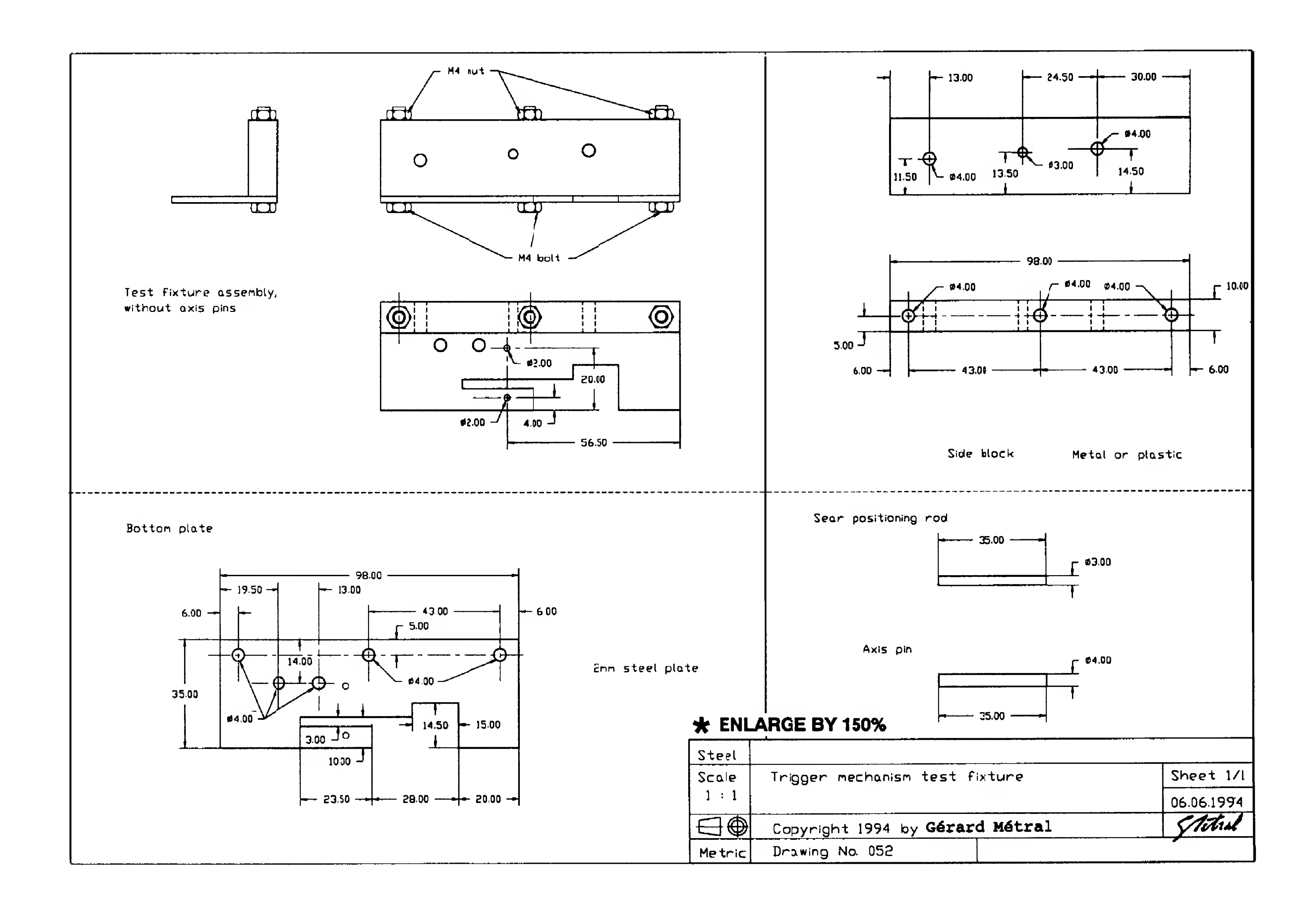
Steel		
Scale 1 : 1	Device to help the forming operation of the sights' collars	Sheet 1/1 06.06.1994
		[signature]
Metric	Drawing No. 049	Tool 4



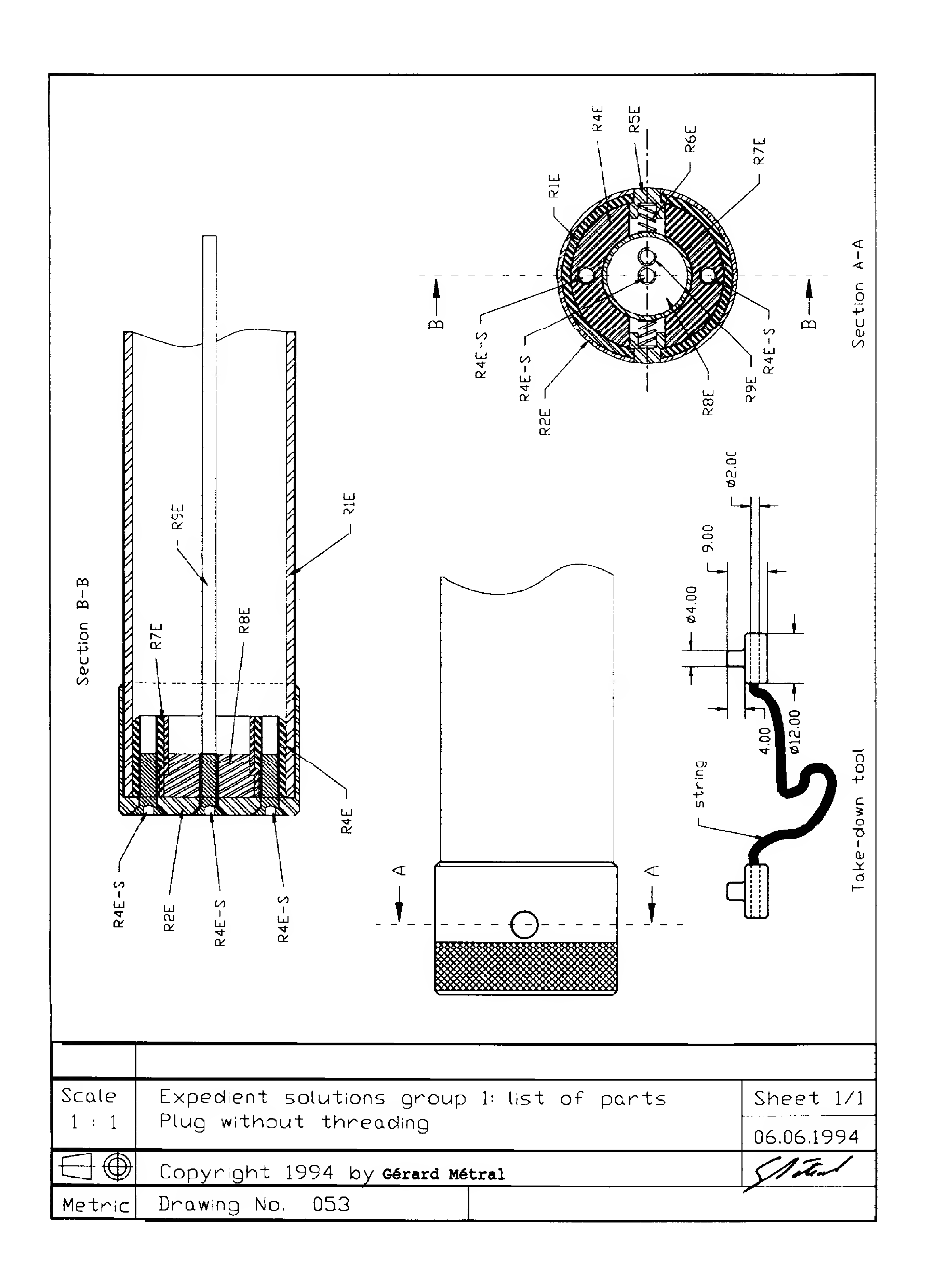
ø9.00
25.00
10.50
brass
ø8.00
ø2.00
standard cartridge case with boxer primer
soft solder
soft solder
Decapping punch
ø10.00
6.30
steel
5.00
ø1.80
36.00
piano wire
ø1.80
Steel
Scale
2 : 1
Dummy round 9mm Parabellum
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 050



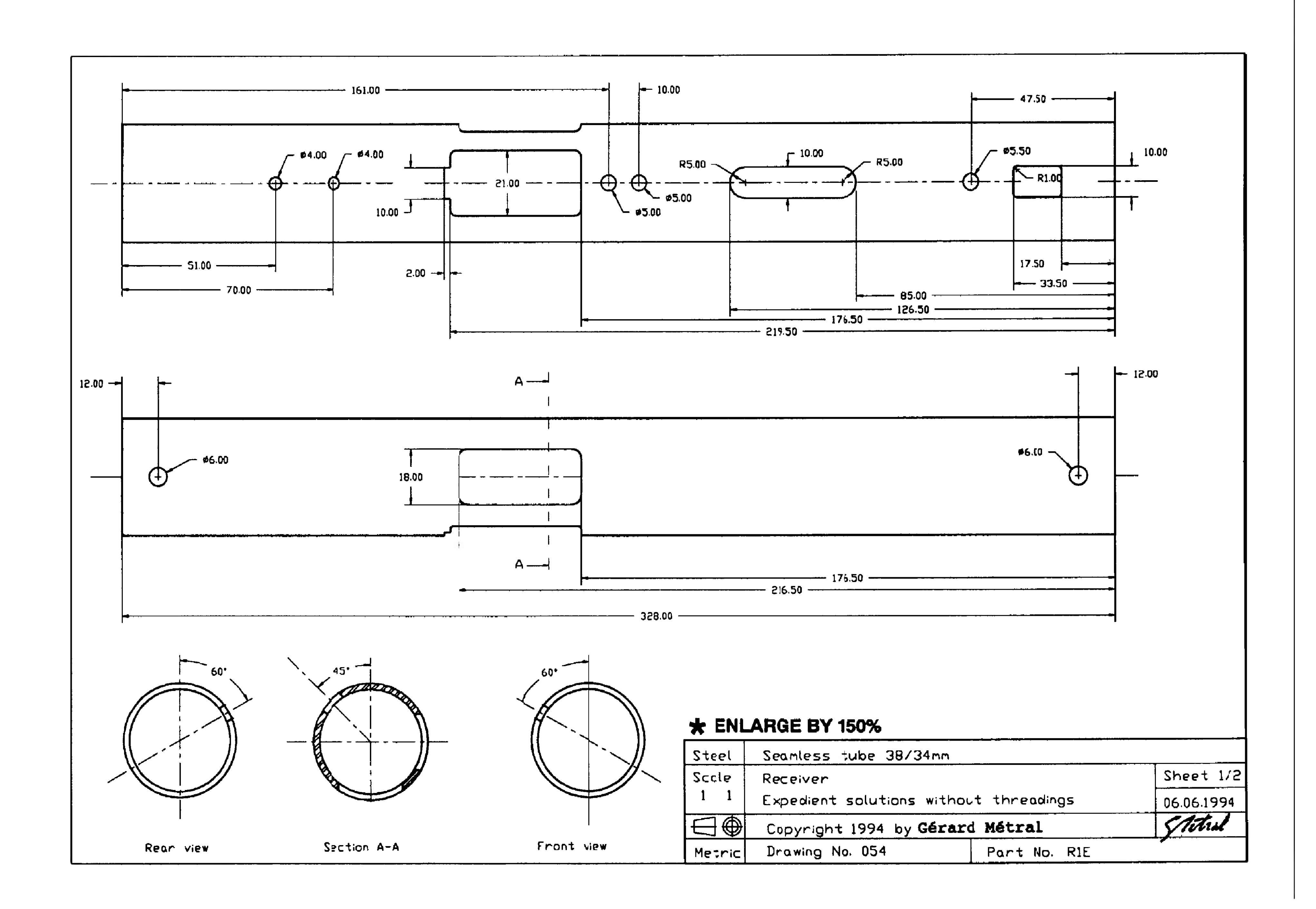
FD1
14.50
23.00
ø5.00
21.50
144.00
57.50
ø5.00
14.50
23.00
39.00
R1.50
R1.50
R1.50
R1.50
23.00
21.00
FD3
66°
79.00
6.00
14.50
21.50
57.50
144.00
57.50
14.50
5mm steel sheet
FD7 Guide rod
110.00
ø5.00
FD2
40.00
14.50
21.50
57.50
144.00
57.50
14.50
0.5mm steel sheet
FD1
FD2
FD3
FD4
FD5
FD6
FD6
FEMALE DIE
FD7
FD1
MALE DIE
FD4 = M6 bolt
FD5 = M6 nut
FD6 = M6 spring washer
* ENLARGE BY 150%
Steel
Scale
1 : 1
Magazine housing forming de
for smallscale production
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 051
Tool 5

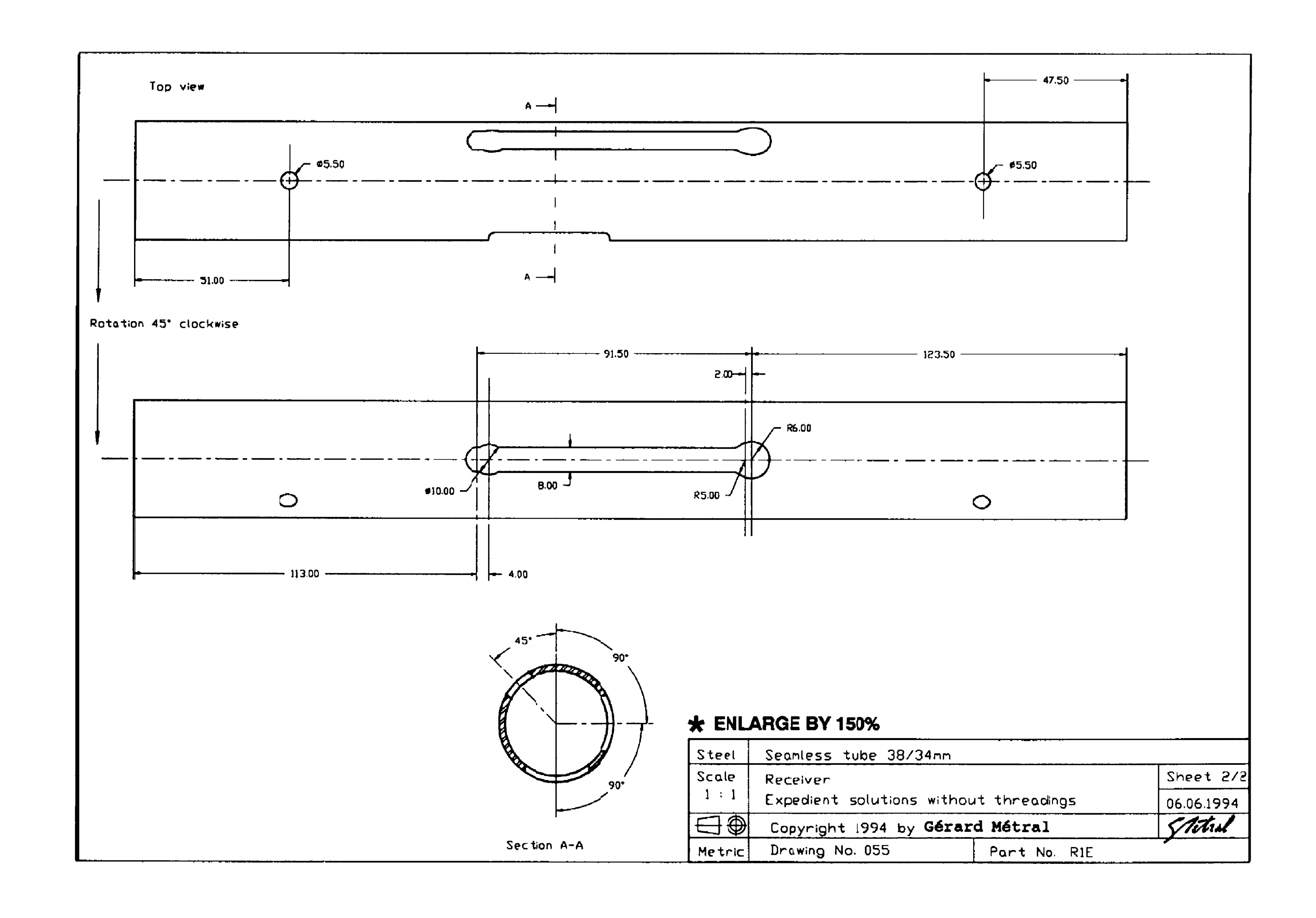


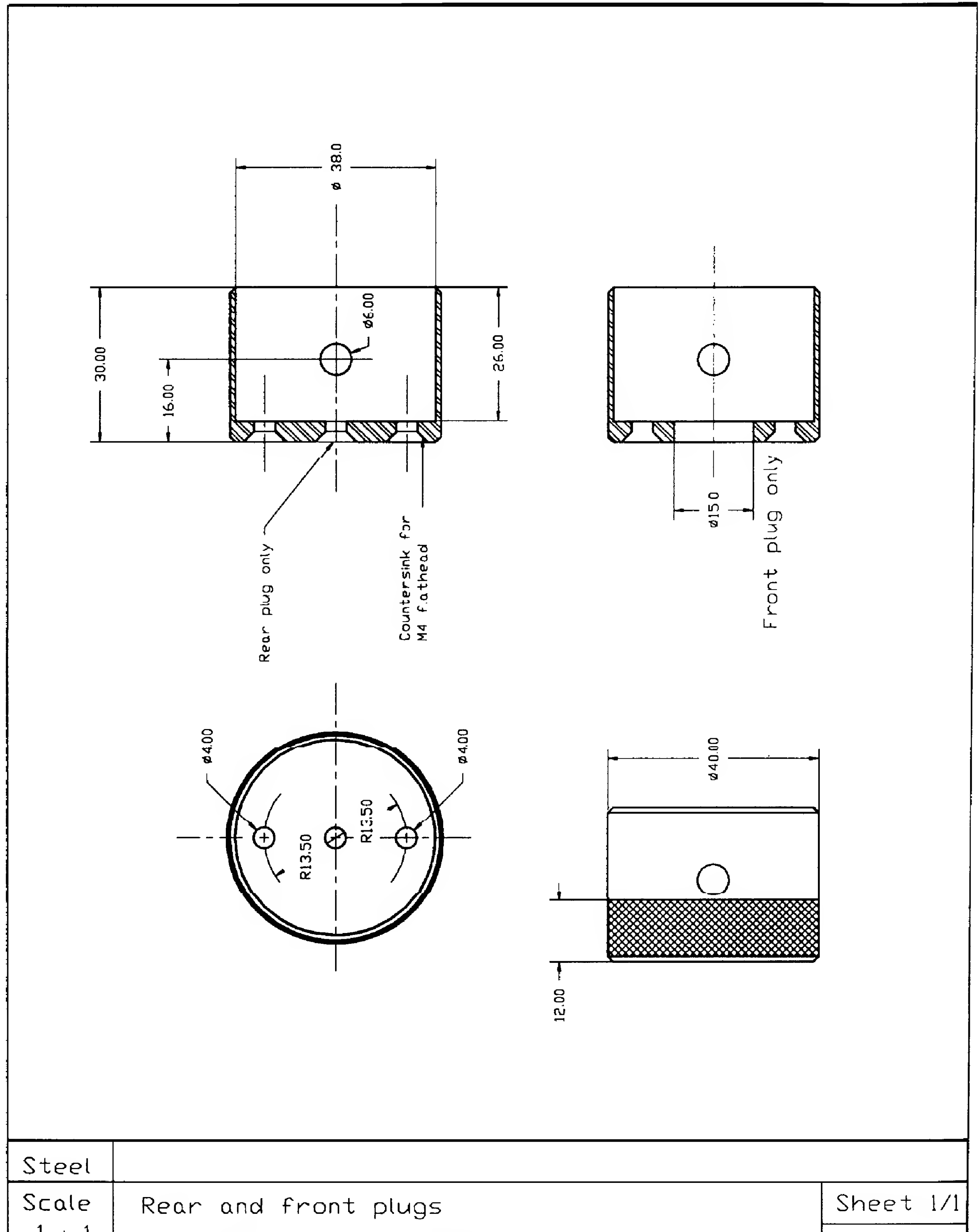
M4 nut
M4 bolt
Test fixture assembly,
without axis pins
ø2.00
20.00
4.00
56.50
13.00
24.50
30.00
ø4.00
ø3.00
11.50
13.50
14.50
98.00
10.00
5.00
6.00
43.00
Side block
Metal or plastic
Bottom plate
19.50
35.00
14.00
3.00
10.00
23.50
28.00
20.00
15.00
2mm steel plate
Sear positioning rod
Axis pin
* ENLARGE BY 150%
Steel
Scale
1 : 1
Trigger mechanism test fixture
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 052



Section B-B
R9E
R1E
R7E
R8E
R4E
R4E-S
R2E
R4E-S
R4E-S
A
A
R4E
R5E
R6E
R7E
R1E
R4E-S
R4E-S
R2E
R8E
R9E
R4E-S
B
B
Section A-A
ø2.00
9.00
ø4.00
4.00
ø12.00
string
Take-down tool
Scale
1 : 1
Expedient solutions group 1: list of parts
Plug without threading
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 053


161.00
10.00
47.50
ø4.00
ø4.00
21.00
10.00
ø5.00
ø5.00
R5.00
10.00
R5.00
ø5.50
R1.00
10.00
51.00
70.00
2.00
17.50
33.50
85.00
126.50
176.50
219.50
12.00
A
ø6.00
18.00
ø6.00
12.00
A
176.50
216.50
328.00
60°
45°
60°
Rear view
Section A-A
Front view
★ ENLARGE BY 150%
Steel
Seamless tube 38/34mm
Scale 1 1
Receiver
Expedient solutions without threadings
Sheet 1/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 054
Part No. R1E


Top view
A
A
ø5.50
ø5.50
47.50
51.00
Rotation 45° clockwise
91.50
123.50
2.00
R6.00
ø10.00
8.00
R5.00
113.00
4.00
45°
90°
90°
Section A-A
★ ENLARGE BY 150%
Steel
Seamless tube 38/34mm
Scale
1 : 1
Receiver
Expedient solutions without threadings
Sheet 2/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 055
Part No. R1E



Steel

Scale 1 : 1

Rear and front plugs

Expedient solutions without threadings

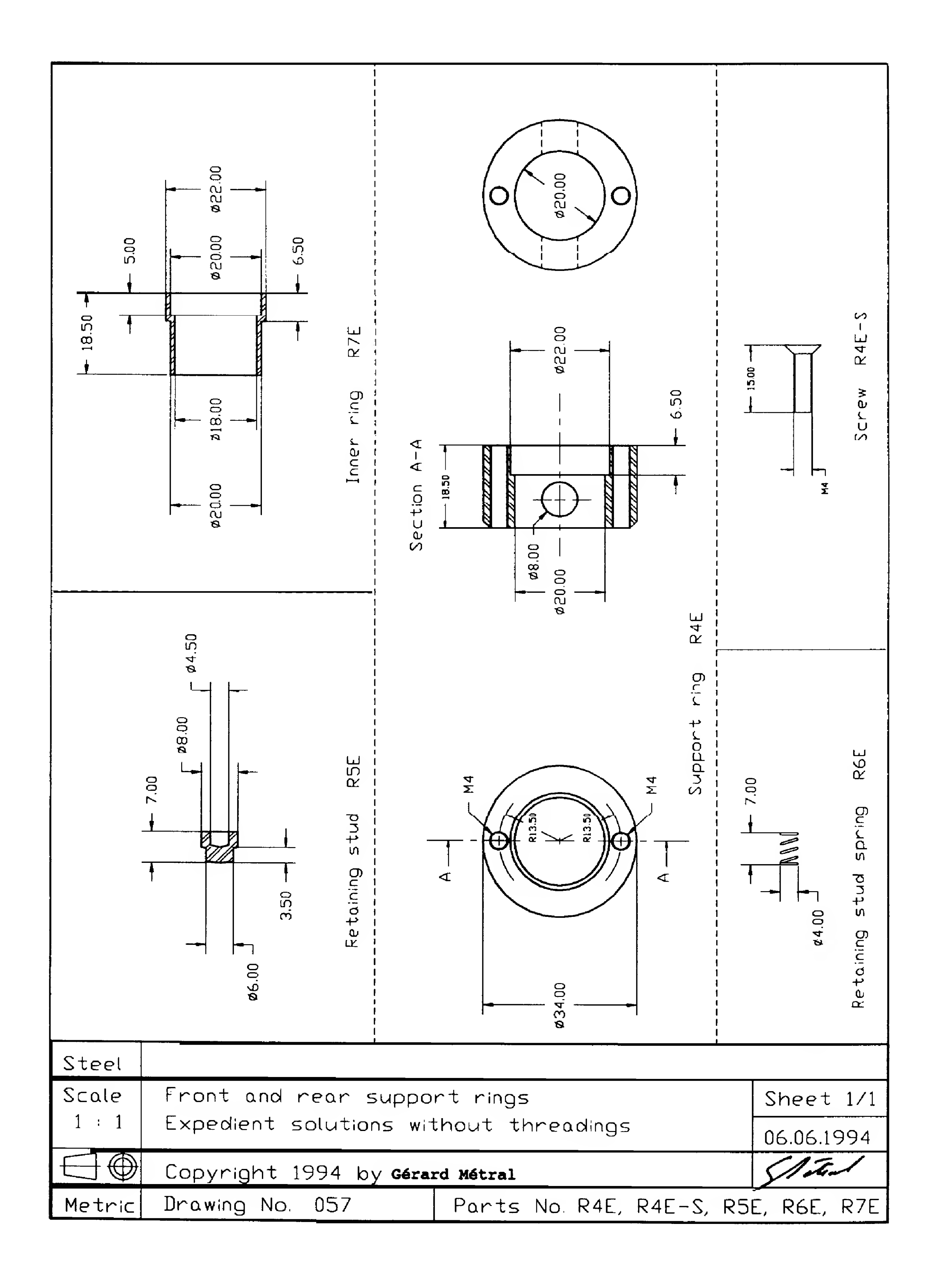
Sheet 1/1

06.06.1994

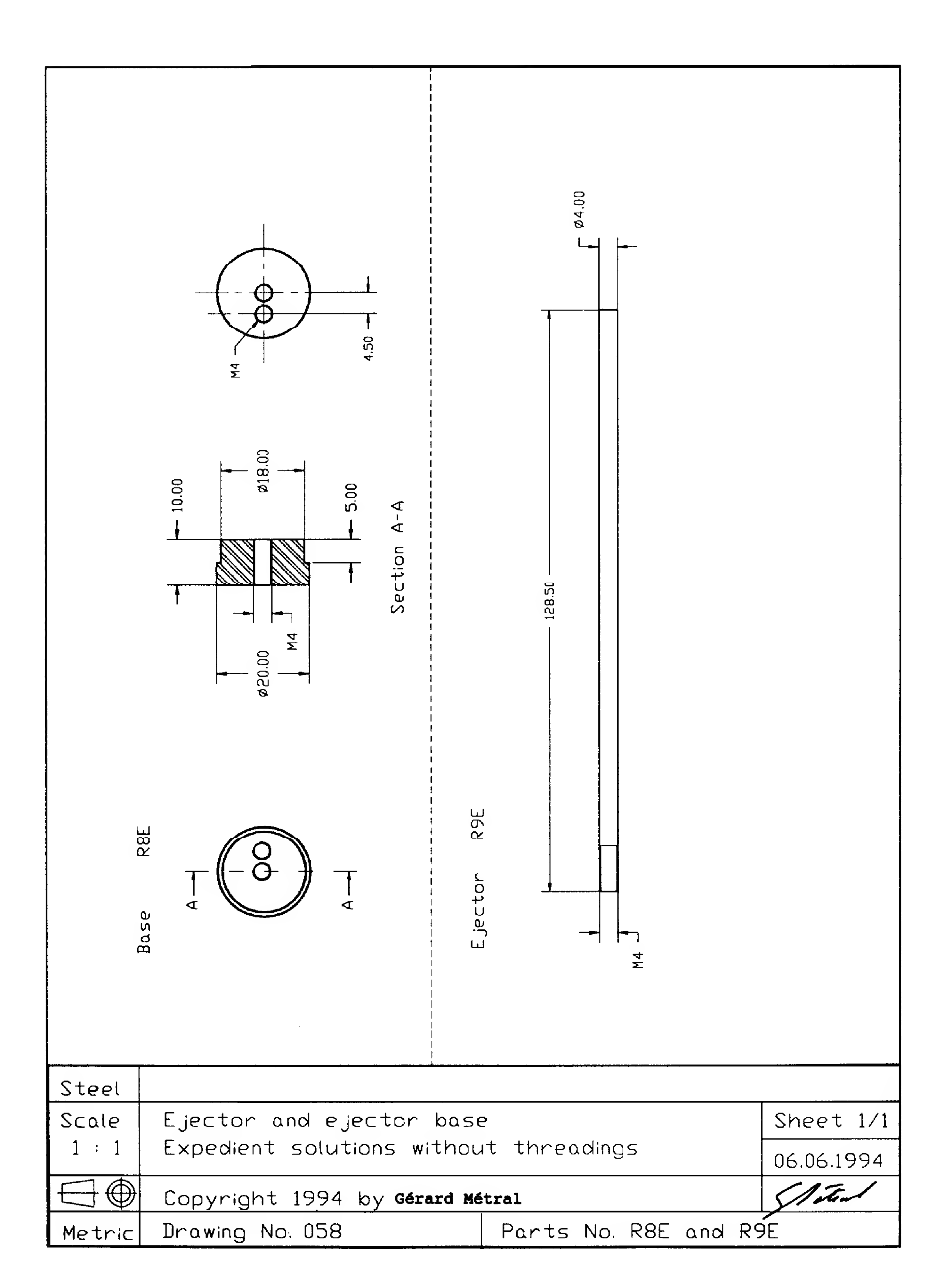
Metric

Drawing No. 056

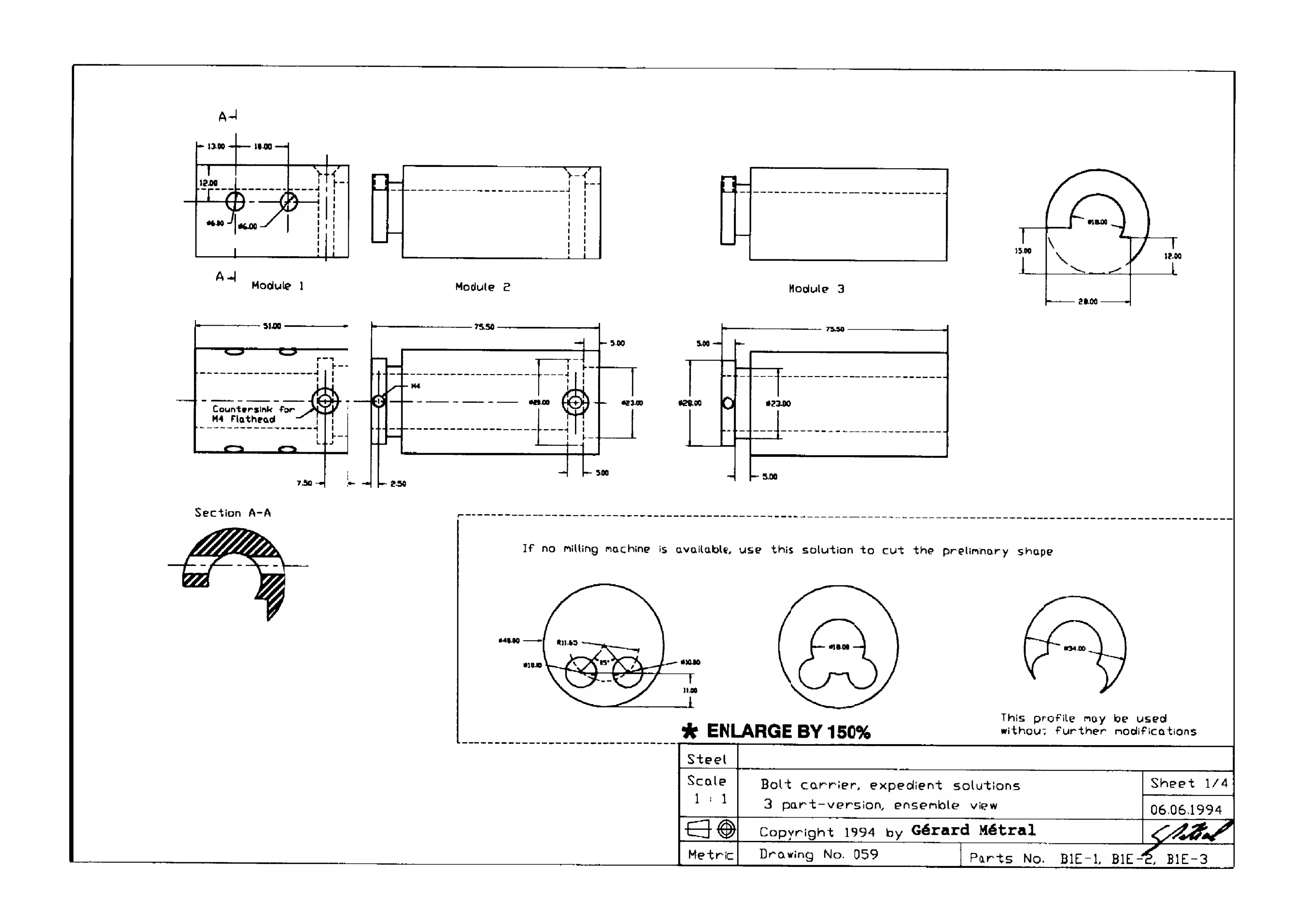
Parts No. R2E and R3E

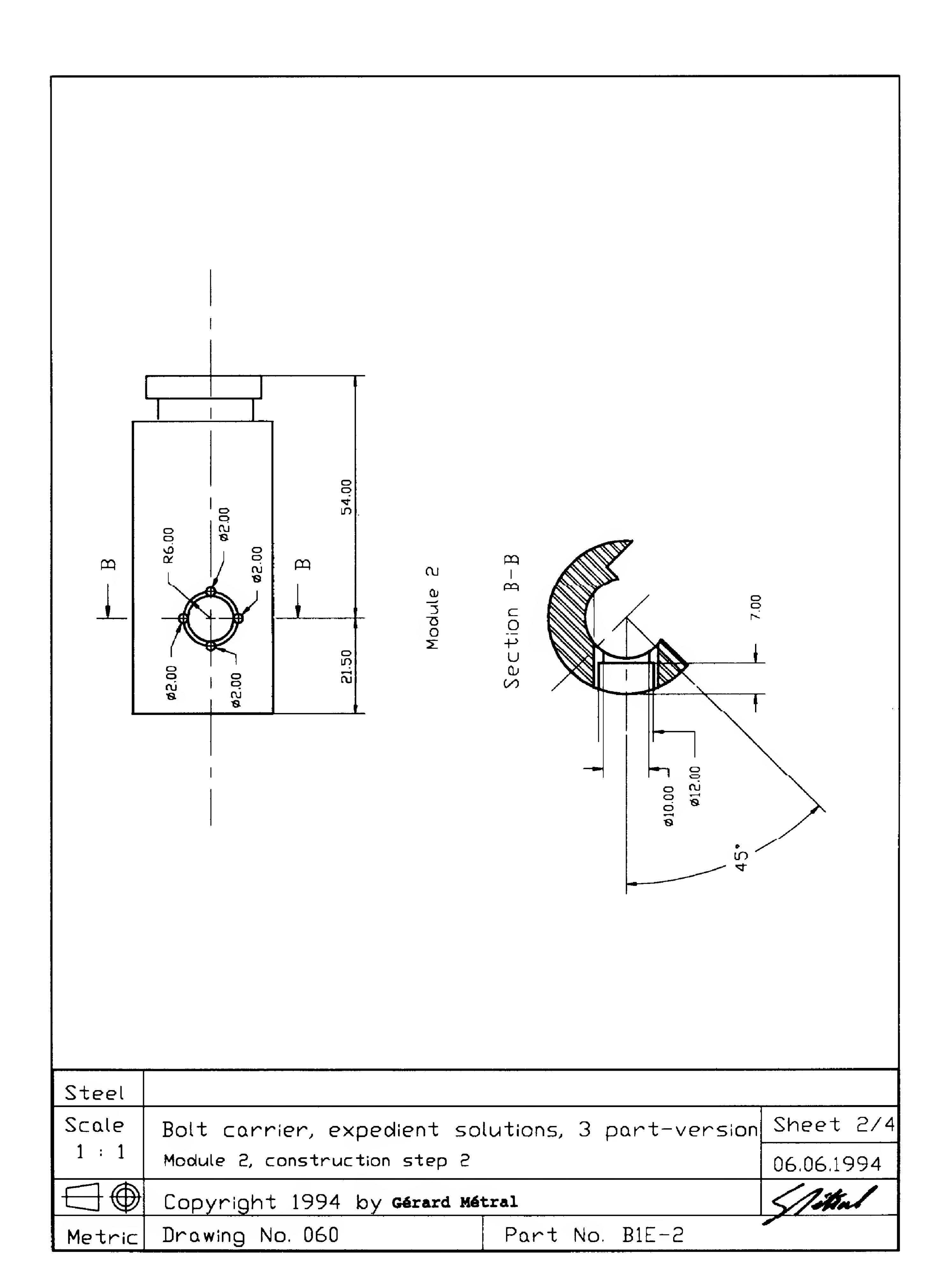


Inner ring R7E
ø22.00
ø20.00
5.00
6.50
18.50
ø18.00
ø20.00
Section A-A
ø20.00
ø22.00
6.50
18.50
ø8.00
ø20.00
Support ring R4E
Screw R4E-S
15.00
M4
Retaining stud R5E
ø4.50
ø8.00
7.00
3.50
ø6.00
M4
M4
R13.50
R13.50
A
A
ø34.00
Retaining stud spring R6E
7.00
ø4.00
Steel
Scale 1 : 1
Front and rear support rings
Expedient solutions without threadings
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 057
Parts No. R4E, R4E-S, R5E, R6E, R7E

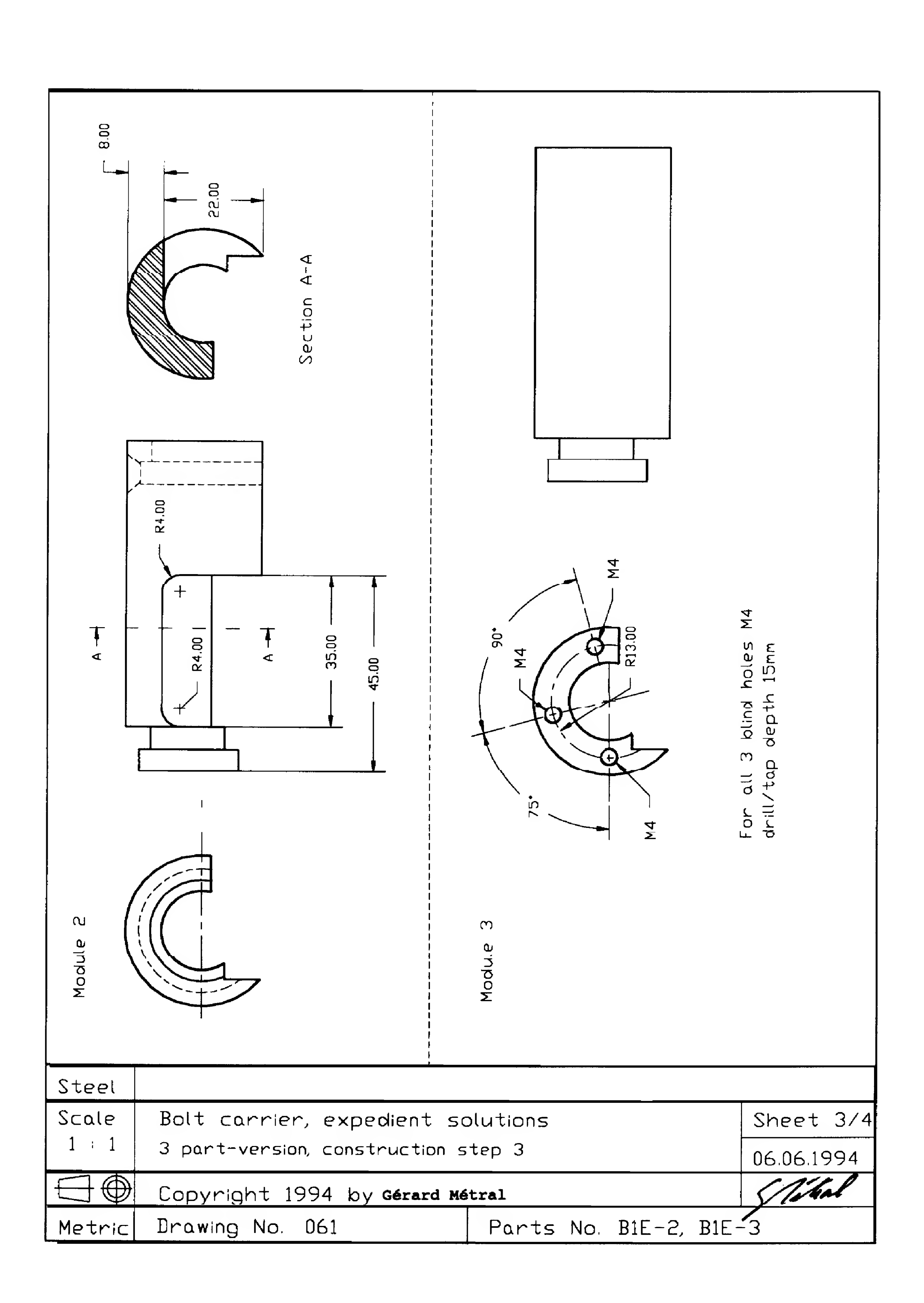


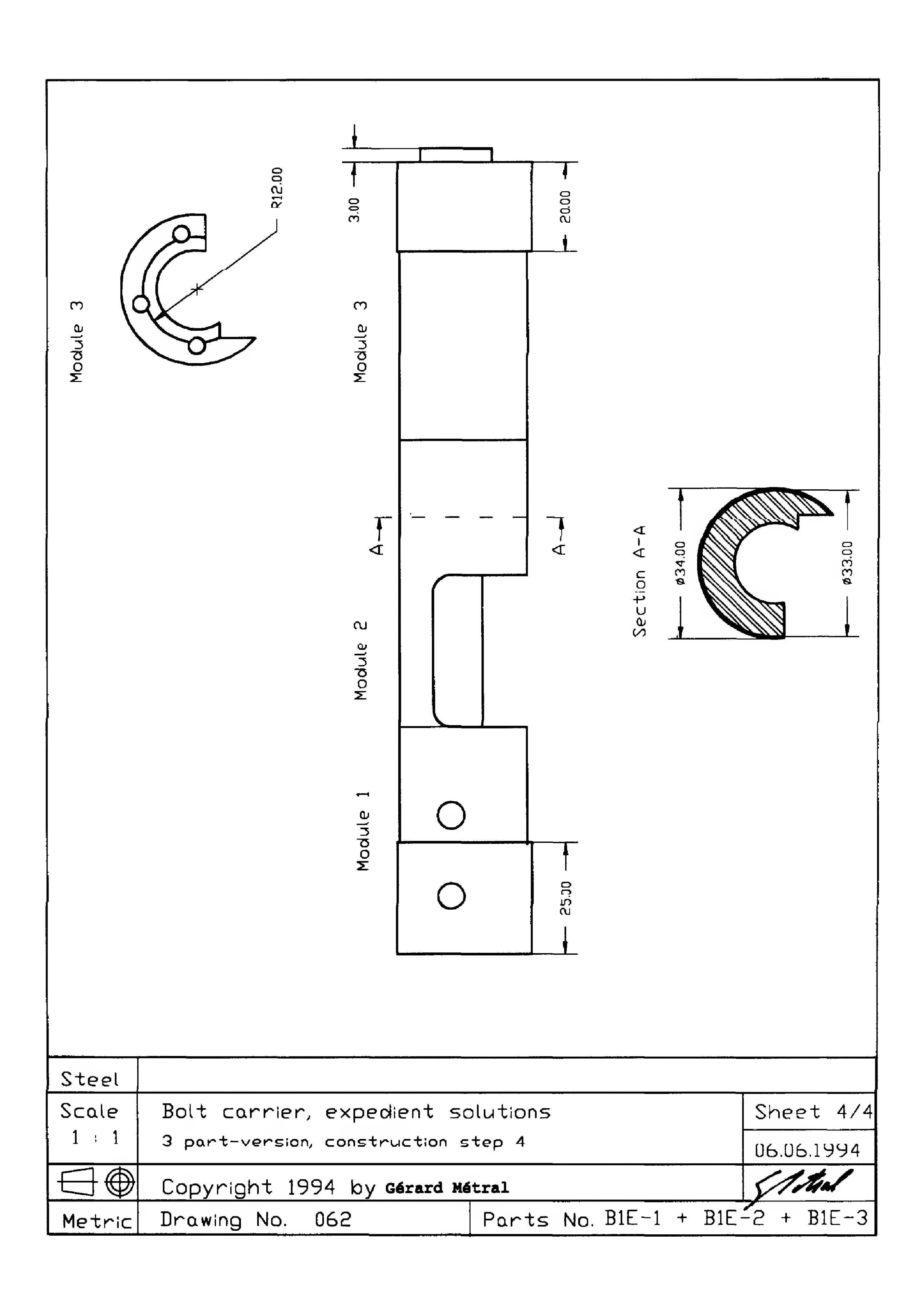
Ø4.00
4.50
M4
Ø18.00
10.00
5.00
Section A-A
128.50
M4
Ø20.00
Base R8E
A
A
Ejector R9E
M4
Steel
Scale
1 : 1
Ejector and ejector base
Expedient solutions without threadings
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 058
Parts No. R8E and R9E

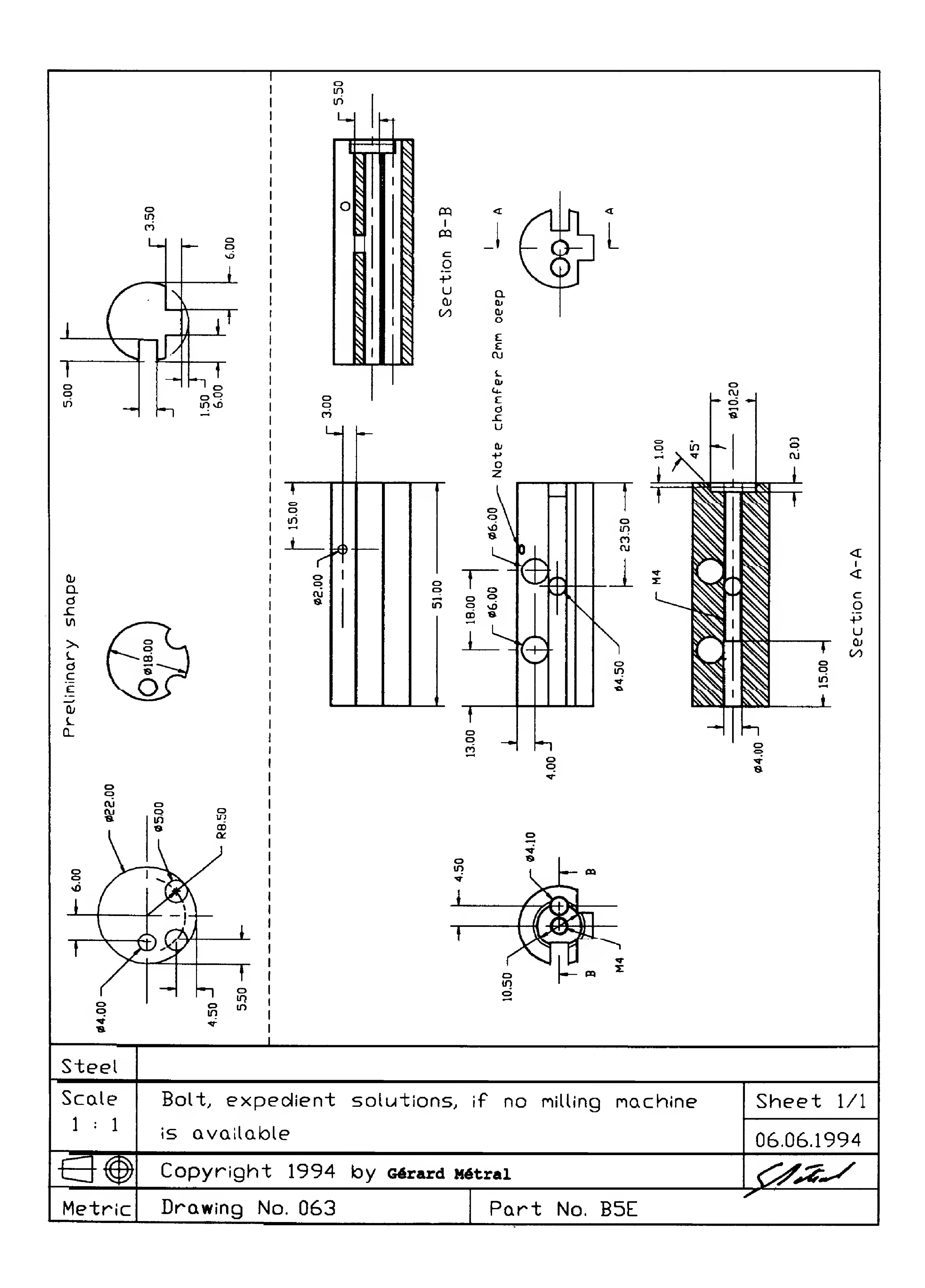

A
13.00
18.00
12.00
ø6.80
ø6.00
Module 1
Module 2
Module 3
ø18.00
15.00
12.00
28.00
51.00
75.50
75.50
5.00
5.00
Countersink for
M4 Flathead
M4
ø28.00
ø23.00
ø28.00
ø23.00
7.50
2.50
5.00
5.00
Section A-A
If no milling machine is available, use this solution to cut the preliminary shape
ø48.80
R11.65
ø10.80
ø10.80
11.00
ø18.00
ø34.00
This profile may be used
without further modifications
* ENLARGE BY 150%
Steel
Scale
1 : 1
Bolt carrier, expedient solutions
3 part-version, ensemble view
Sheet 1/4
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 059
Parts No. B1E-1, B1E-2, B1E-3

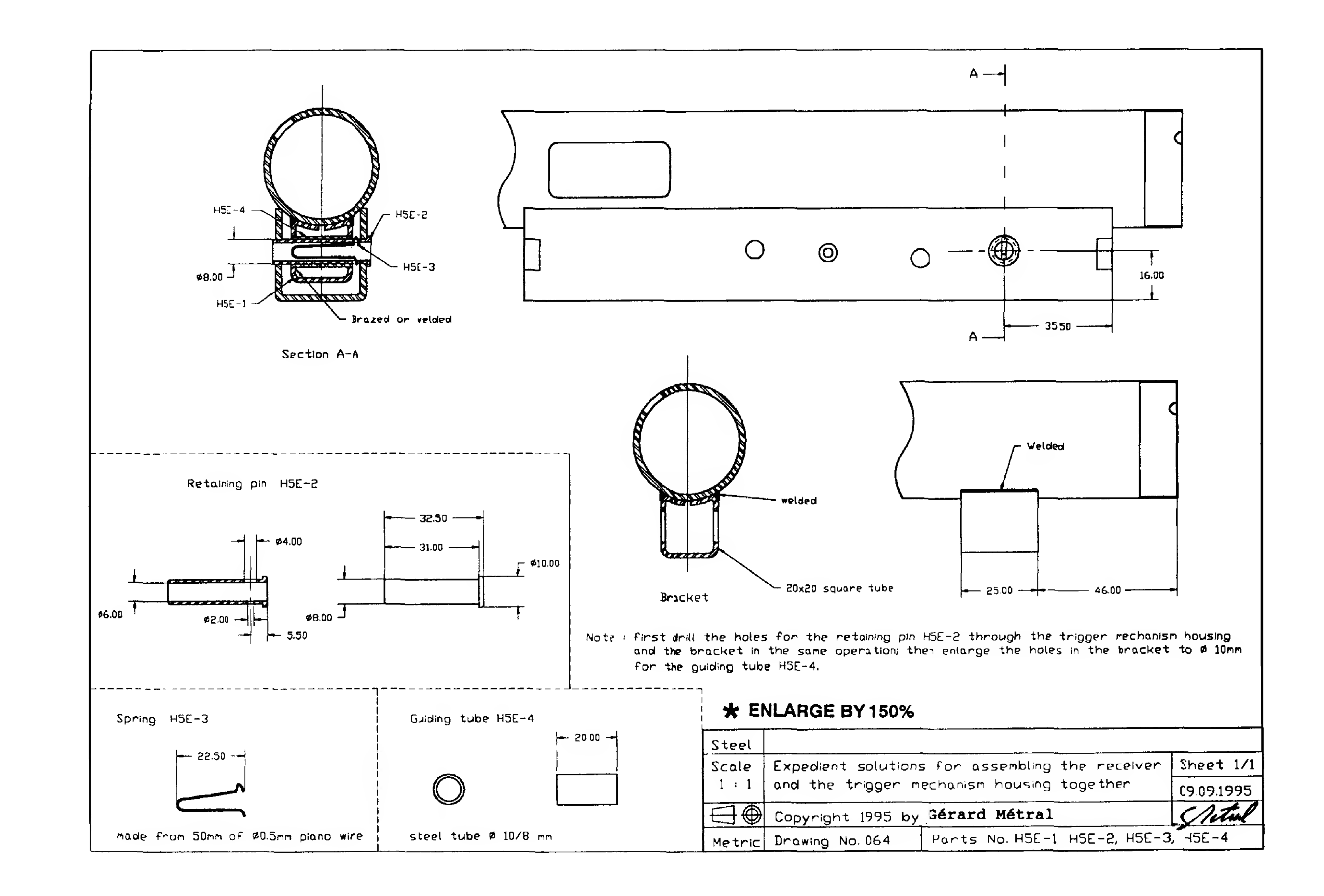


B
B
R6.00
ø2.00
ø2.00
ø2.00
ø2.00
54.00
21.50
Module 2
Section B-B
7.00
ø10.00
ø12.00
45°
Steel
Scale
1 : 1
Bolt carrier, expedient solutions, 3 part-version
Module 2, construction step 2
Sheet 2/4
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 060
Part No. B1E-2


8.00
22.00
Section A-A
R4.00
R4.00
A
A
35.00
45.00
Module 2
M4
90°
M4
R13.00
75°
M4
For all 3 blind holes M4
drill/tap depth 15mm
Module 3
Steel
Scale
1 : 1
Bolt carrier, expedient solutions
3 part-version, construction step 3
Sheet 3/4
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 061
Parts No. B1E-2, B1E-3


R12.00
Module 3
3.00
20.00
Module 3
A
A
Section A-A
ø34.00
ø33.00
Module 2
Module 1
25.00
Steel
Scale
1 : 1
Bolt carrier, expedient solutions
3 part-version, construction step 4
Sheet 4/4
06.06.1994
Metric
Drawing No. 062
Parts No. B1E-1 + B1E-2 + B1E-3

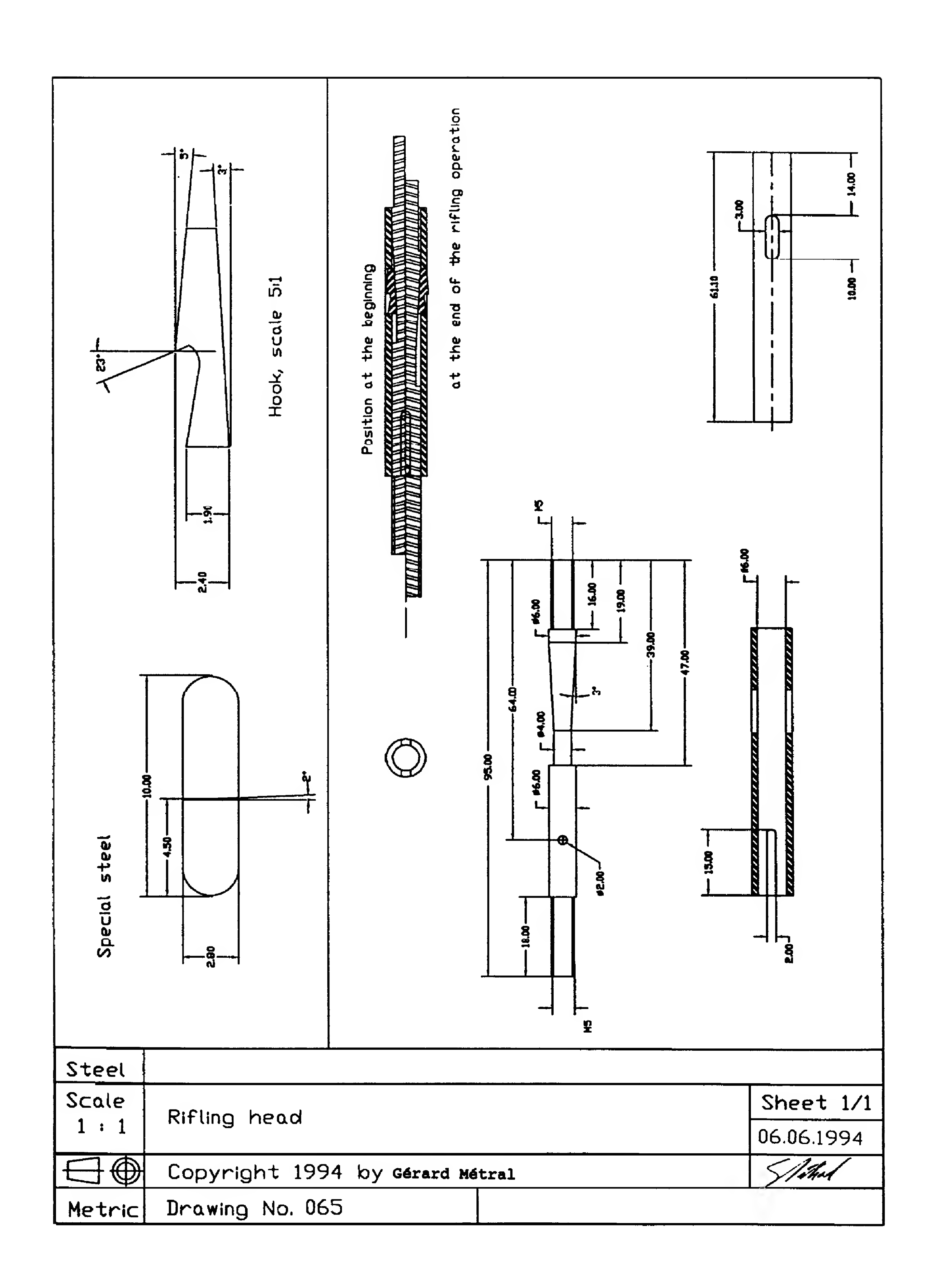

Preliminary shape
Section B-B
Note chamfer 2mm deep
Section A-A
Steel
Scale
1 : 1
Bolt, expedient solutions, if no milling machine is available
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 063
Part No. B5E



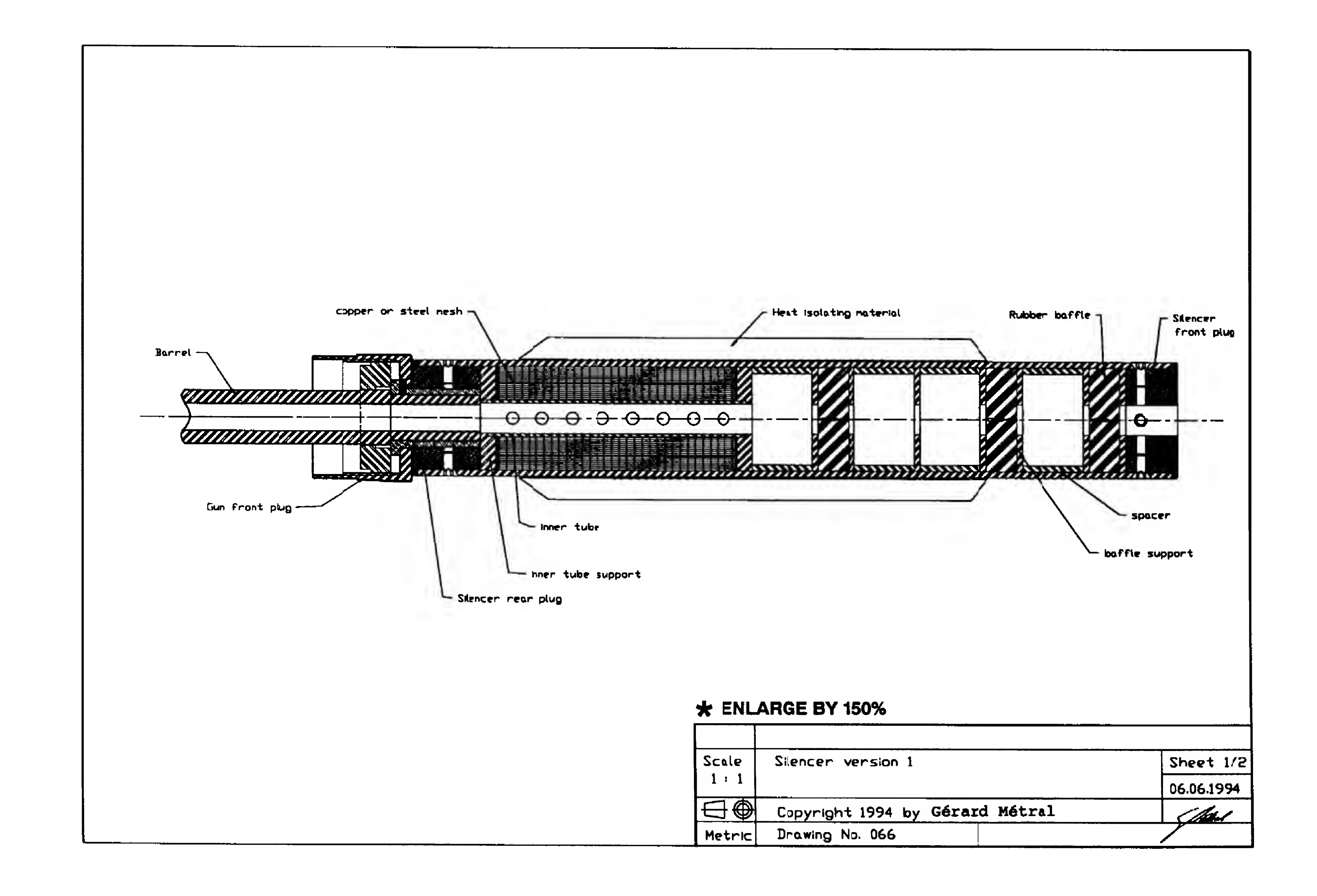
Note : first drill the holes for the retaining pin H5E-2 through the trigger mechanism housing and the bracket in the same operation; then enlarge the holes in the bracket to ø 10mm for the guiding tube H5E-4.

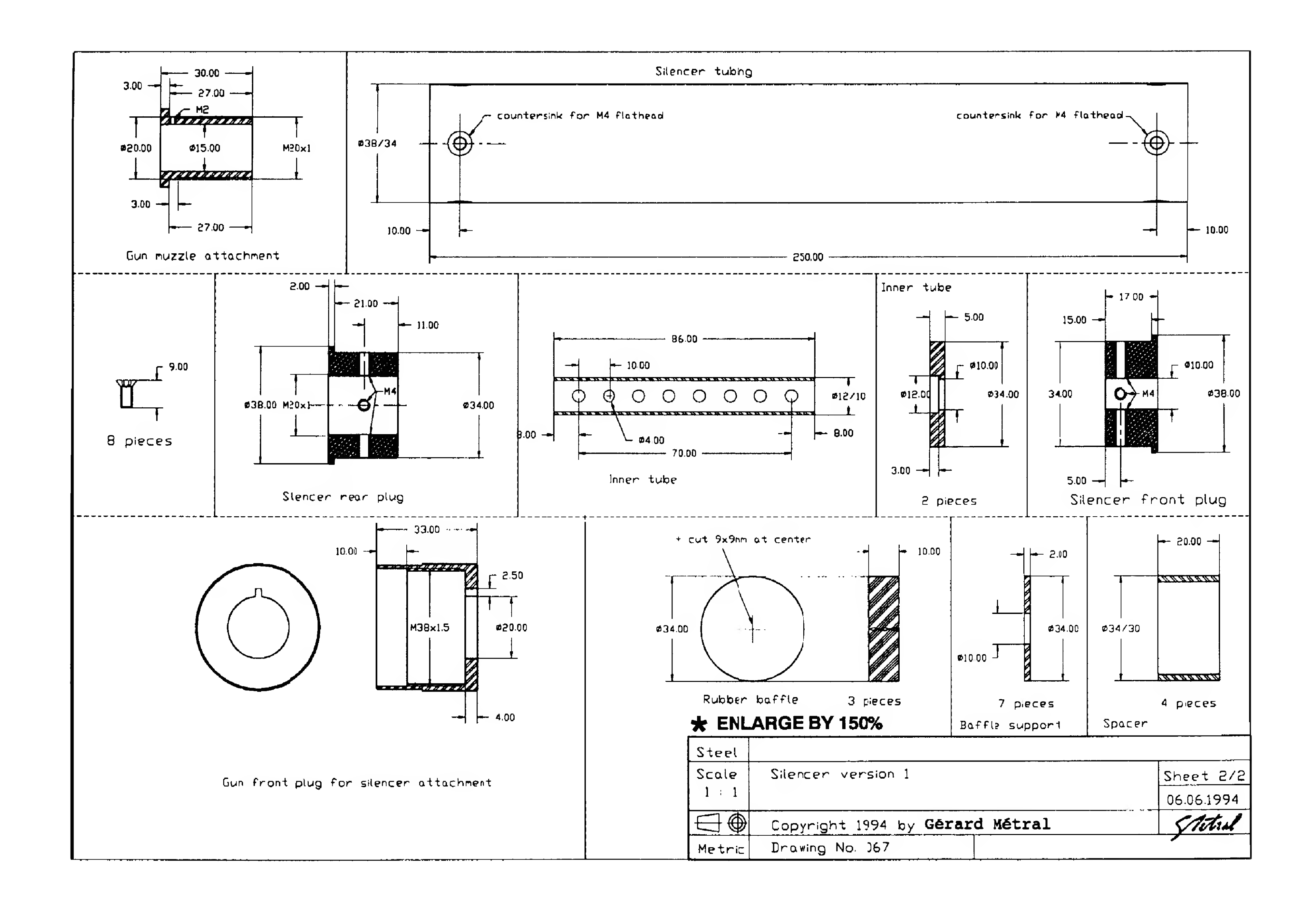
★ ENLARGE BY 150%

Steel		
Scale 1 : 1	Expedient solutions for assembling the receiver and the trigger mechanism housing together	Sheet 1/1 09.09.1995
Metric	Drawing No. 064	Parts No. H5E-1, H5E-2, H5E-3, H5E-4

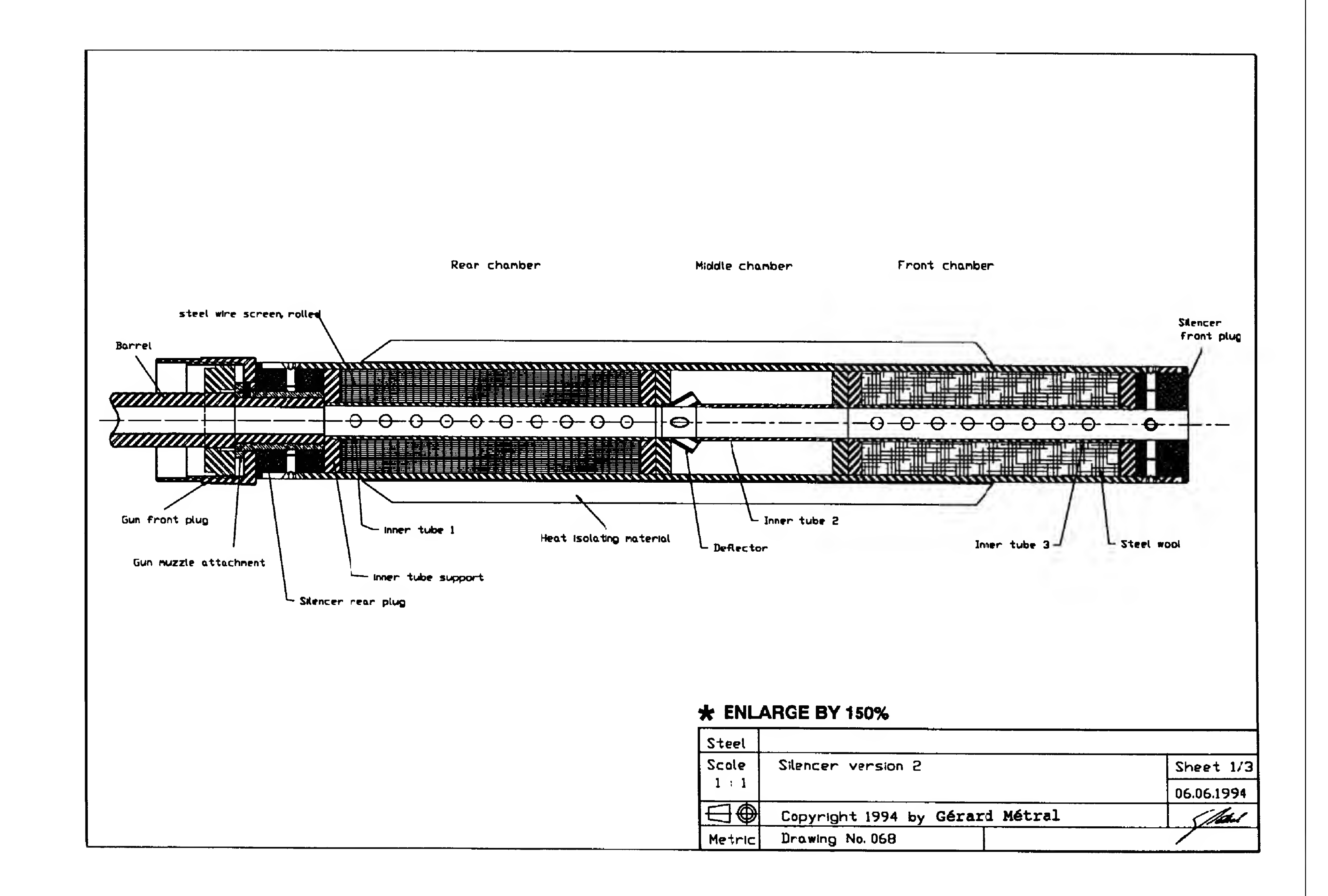


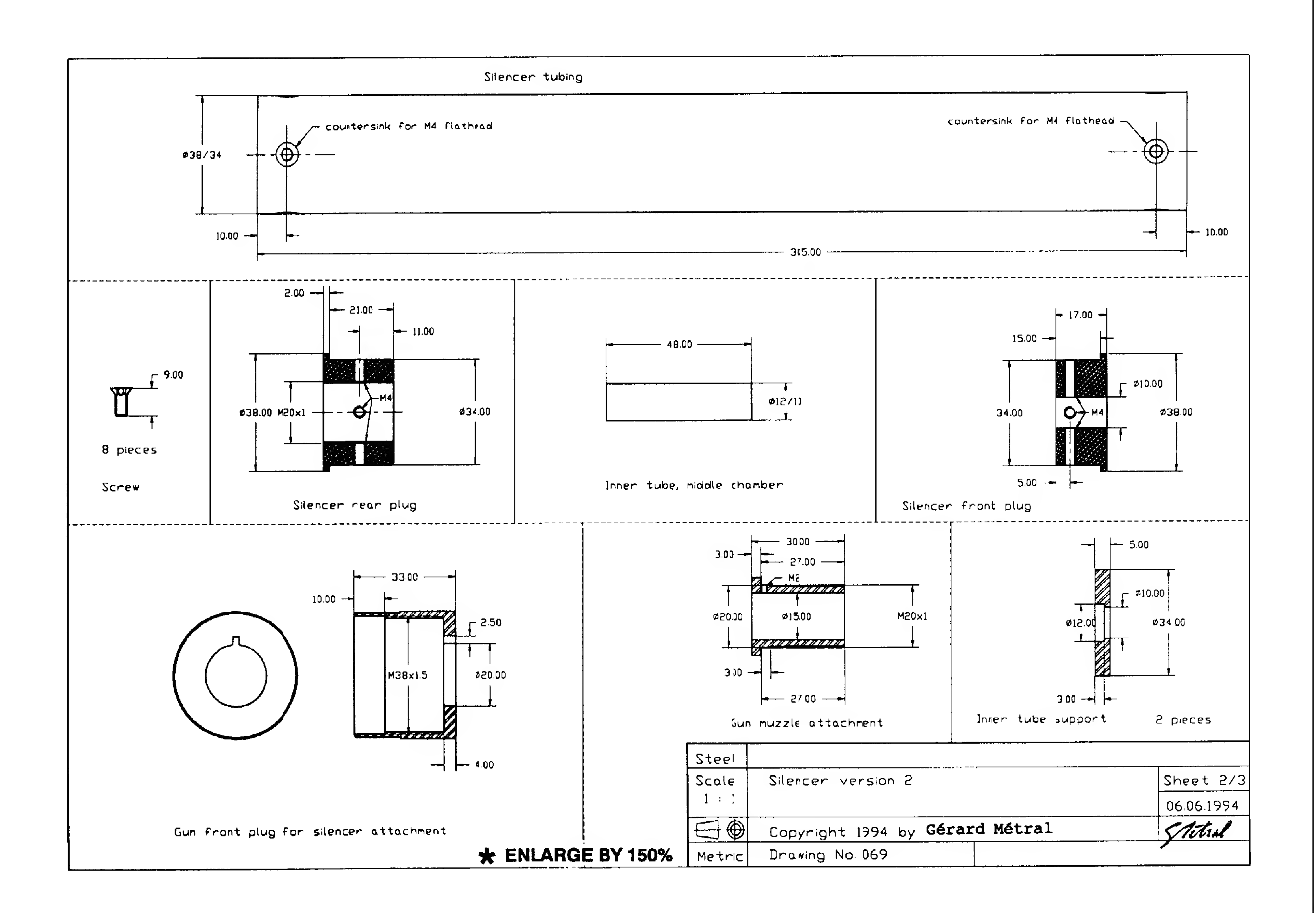
Hook, scale 5:1
Special steel
Position at the beginning
at the end of the rifling operation
Steel
Scale
1 : 1
Rifling head
Sheet 1/1
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 065


Barrel
copper or steel mesh
Heat isolating material
Rubber baffle
Silencer
front plug
Gun front plug
inner tube
inner tube support
Silencer rear plug
spacer
baffle support
* ENLARGE BY 150%
Scale
1 : 1
Silencer version 1
Sheet 1/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 066

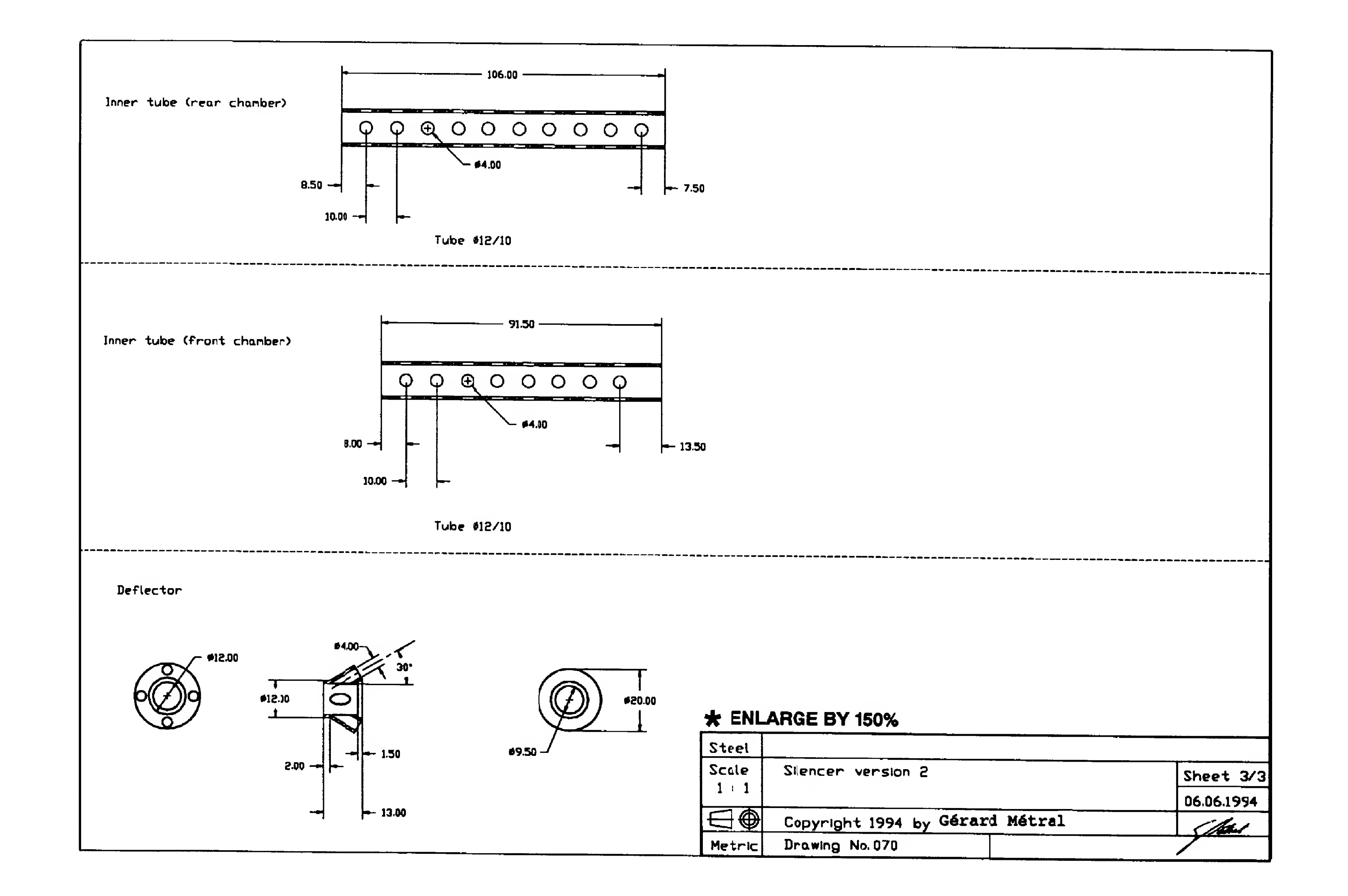


Gun muzzle attachment
30.00
27.00
3.00
M2
ø20.00
ø15.00
M20x1
27.00
Silencer tubing
countersink for M4 flathead
ø38/34
10.00
250.00
8 pieces
9.00
Slencer rear plug
2.00
21.00
11.00
ø38.00
M20x1
M4
ø34.00
Inner tube
86.00
10.00
ø12/10
ø4.00
70.00
8.00
Inner tube
5.00
ø10.00
ø12.00
ø34.00
3.00
2 pieces
Silencer front plug
17.00
15.00
34.00
ø10.00
M4
ø38.00
5.00
Gun front plug for silencer attachment
33.00
10.00
2.50
M38x1.5
ø20.00
4.00
+ cut 9x9mm at center
ø34.00
Rubber baffle
3 pieces
* ENLARGE BY 150%
7 pieces
Baffle support
2.00
ø10.00
ø34.00
Spacer
4 pieces
20.00
ø34/30
Steel
Scale
1 : 1
Silencer version 1
Sheet 2/2
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. J67


Rear chamber
Middle chamber
Front chamber
steel wire screen rolled
Barrel
Silencer front plug
Gun front plug
Inner tube 1
Heat isolating material
Inner tube 2
Deflector
Inner tube 3
Steel wool
Gun muzzle attachment
Inner tube support
Silencer rear plug
* ENLARGE BY 150%
Steel
Scale 1 : 1
Silencer version 2
Sheet 1/3
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 068



Silencer tubing
countersink for M4 flathead
countersink for M4 flathead
ø38/34
10.00
10.00
305.00
2.00
21.00
11.00
9.00
ø38.00 M20x1
M4
ø34.00
8 pieces
Screw
Silencer rear plug
48.00
ø12/10
Inner tube, middle chamber
17.00
15.00
ø10.00
34.00
M4
ø38.00
5.00
Silencer front plug
33.00
10.00
2.50
M38x1.5
ø20.00
4.00
Gun front plug for silencer attachment
30.00
3.00
27.00
M2
ø20.00
ø15.00
M20x1
3.00
27.00
Gun muzzle attachment
5.00
ø10.00
ø12.00
ø34.00
3.00
Inner tube support
2 pieces
Steel
Scale
1 : 1
Silencer version 2
Sheet 2/3
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 069
* ENLARGE BY 150%


Inner tube (rear chamber)
106.00
ø4.00
8.50
10.00
7.50
Tube ø12/10
Inner tube (front chamber)
91.50
ø4.00
8.00
10.00
13.50
Tube ø12/10
Deflector
ø12.00
ø4.00
30°
ø12.10
2.00
1.50
13.00
ø20.00
ø9.50
★ ENLARGE BY 150%
Steel
Scale
1 : 1
Silencer version 2
Sheet 3/3
06.06.1994
Copyright 1994 by Gérard Métral
Metric
Drawing No. 070



LIST OF STANDARD INDUSTRIAL COMPONENTS

Designation System

Example: M4x15 = M4 is the threading (metric 4mm); 15 is the length of the threaded part, in millimeters.

Standard Screws

	Parts #	*Quantity*
Headless Allen screw M4x5	R10, B10	2
Flathead M4x15	B3	3
Allen screw M4x5	H6	2
Allen screw M4x10	H11	2
Allen screw M3x30	G6	1
Flathead M4x5	F8	2
Flathead M4x20	F9	1
Flathead M4x25	F13	1
Flathead M4x30	F14	2
Self-tapping screw CL S, ST 4.8 - 13	W2	1
Self-tapping screw CL S, ST 4.2 - 13	W4	1

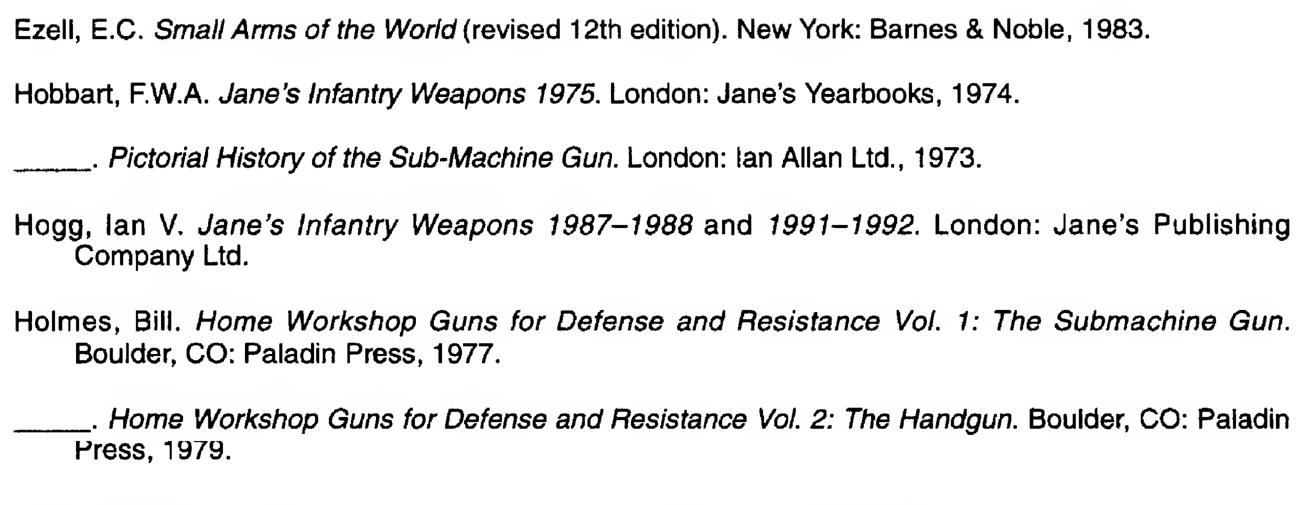
Modified Standard Screws (Original Dimensions, Modifications Given in the Drawings)

Parts #	*Quantity*	
Hexagonal head M4x15 mm	R16	2
Allen screw M4x5	B9, B14	2
Allen screw M4x10	H4	2
Flathead M5x10	H8	1
Flathead M3x30	T15	1
Cylindrical head M3x10	S5	2
Flathead M3x10	F3	1

Standard Nuts

M3 self-locking nuts	T16, G7, S6, F17	4
M4 self-locking nuts	F10	4

BIBLIOGRAPHY



Ezell, E.C. *Small Arms of the World* (revised 12th edition). New York: Barnes & Noble, 1983.

Hobbart, F.W.A. *Jane's Infantry Weapons 1975.* London: Jane's Yearbooks, 1974.

______. *Pictorial History of the Sub-Machine Gun.* London: Ian Allan Ltd., 1973.

Hogg, Ian V. *Jane's Infantry Weapons 1987–1988* and *1991–1992.* London: Jane's Publishing Company Ltd.

Holmes, Bill. *Home Workshop Guns for Defense and Resistance Vol. 1: The Submachine Gun.* Boulder, CO: Paladin Press, 1977.

______. *Home Workshop Guns for Defense and Resistance Vol. 2: The Handgun.* Boulder, CO: Paladin Press, 1979.

Jane's Yearbook 1987 and *1991.* London: Jane's Publishing Company Ltd.

MacFarland, H.E. *Introduction to Modern Gunsmithing.* Harrisburg, PA: Stackpole Books, 1971.

Machu, Willi. *Die Phosphatierung.* Weinhein: Verlag Chemie, 1950.

Paladin Press. *Home Workshop Silencers I.* Boulder, CO: Paladin Press, 1980.

Skochko, L.W. and H.A. Greveris. *Silencers, Principles, and Evaluation, Report R-1896.* American Ordnance Publications, 1971.

Smith, W.H.B. and J.E. Smith. *Small Arms of the World.* Harrisburg, PA: Stackpole Books, 1966.

ABOUT THE AUTHOR



Gérard Métral has a Ph.D. in biology and teaches at a Swiss university. He is a captain in the Swiss army reserves, where his specialty is artillery. He also has extensive training in mechanics and computer science, which prepared him to create the machinist's drawings that accompany this text. Métral has been a gun collector since the age of 18, and, as such, he has carefully studied all types of small arms to find the best design for a reliable resistance gun. This book is the result of these studies. Métral lives with his family in Geneva.

DO-IT-YOURSELF

You'll never have to worry about which submachine guns turn up on the banned-import list again. Now you can build your own simply by following the complete step-by-step plans and machinist's drawings contained in this book.

The gun you'll turn out will be a 9mm, blowback, selective-fire design with a 32-round magazine. It's just as powerful as an Uzi or HK MP5, but it's lighter and handier, it has fewer parts, it can be clandestinely manufactured even in large numbers, and, best of all, it has no paper trail!

The author, a reserve captain in the Swiss army who has spent years researching and designing "resistance" weapons, borrows the best design features from the CZ 25, Uzi, Suomi M1931, and STEN, but he adds his own innovations to make this weapon more effective, reliable, and quick to assemble.

The increasingly restrictive and overregulated society in which we live calls for extraordinary measures. This homemade submachine gun fits the bill.

Note: The ownership of firearms is regulated by every government. All applicable laws and restrictions also apply to homebuilt models. This book is presented *for academic study only*.

A PALADIN PRESS BOOK
ISBN 0-87364-840-4



